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Original Communications.

ARTICLE I.—*On Spigelia Marilandica. By R. Eglesfeld Griffith, M.D.*

Nat. Ord. GENTIANEÆ.
Sex. Syst. PENTANDRIA MONOGYNIA.

SPIGELIA. *Calyx* 5-parted. *Corolla* funnel formed, border 5-cleft, equal. *Anthers* convergent. *Capsule*, didymous, 2-celled, 4-valved, many seeded. —*Nuttall.*

S. Marilandica. Root, fibrous, perennial. *Stem*, herbaceous, 6-20 inches high, branching near the base, slightly winged, towards the summit pubescent. *Leaves*, sessile, ovate lanceolate, acute, with the margin and veins underneath pubescent. *Flowers*, in a simple, terminal, secund raceme. *Calyx*, 5-leaved, persistent, leaves subulate acute, finely serrulate. *Corolla*, 1-petal, tube angled, ventricose, five times as long as the calyx, yellow within, crimson without, border 5-cleft, segments acute, somewhat expanded. *Filaments*, shorter than the corolla, inserted into the tube between the segments. *Anthers*, oblong, cordate, 2-celled, yellow. *Germ*, superior, ovate. *Style*, longer than the corolla, jointed at its base. *Stigma*, simple, obtuse.—*Elliot.*

Capsule. Subrotund, didymous, 2-celled, 4-valved. *Seeds*, numerous, angular, scabrous.—*Willdenow.*

Synon. Lonicera Marilandica spicis terminalibus. L. Sp. pl. 3. p. 249. Gron. Virg. 142.

Synon. *Periclymeni Virginiani flore coccineo.* Sherard, Raii sup. 32, Catesb. Carol. 11, t. 78.
Anthelmia. Lining. Essays Phys. and Lit. v. 1 and 3.
Spigelia oppositifolia. Stokes. Bot. Mat. Med. I. 309.
S. Americana. Monro. III. 270.
S. Lonicera. Miller, Gard. Dict.
S. Marilandica. L. Syst. Veg. 197. Nuttall, Gen. II. 134. Elliot, I. 236, &c. &c. &c.

Icon. Curt. Bot. Mag. 3, t. 80. Woodville, Med. Bot. 2, t. 105. Bigelow, Med. Bot. I. 46. Barton, Med. Bot. 2, t. 31, &c.

Common Names. Carolina Pink. Indian Pink. Pink root. Worm grass. Starbloom.

Pharm. Spigelia, U. S. Pharm. Radix Spigelia Marilandica. E. Spigelia Radix, L. D.

Offic. Root. Consisting of a great number of slender, blackish fibres, forming a dense bunch. Generally imported from the southern states, in bundles of about a foot in length, consisting of the whole plant. Taste of root nauseous.

Description. Few of the medicinal plants are possessed of greater beauty, than the species now under consideration: it is an herbaceous perennial, of from six to twenty inches in height, with a root consisting of a great number of slender fibres, forming a dense tuft; they are of a yellow colour when first removed from the earth, but become brownish-black on exposure to the air. From the root proceed many quadrangular, smooth, annual stems of a purplish colour, furnished with sessile, opposite, ovate, entire leaves, glabrous except on the margins and inferior nervures, where they are pubescent. The flowers, which are few in number, are borne on a terminal raceme, which is secund or leaning to one side, and are furnished with short peduncles. The corolla is funnel shaped, contracted towards the top, and divided into five acute segments. It is of a rich carmine colour externally, with the exception of near the base where it is whitish; the interior is of an orange yellow. The margins of the segments of the corolla are slightly tinged with green. Not more than one or two of the flowers are expanded at the same time. The calyx which is persistent, consists of five long, finely serrate leaves, which are reflected when the fruit is mature. The stamina are shorter than the corolla, and though inserted near the upper part of the tube, are decurrent and may be traced to its

base. The anthers are oblong and narrow. The style is about the length of the corolla, jointed below, and terminated by a fusiform, acute, pubescent stigma. The germ is superior and ovate. The capsule is double, with two globular lobes and cells, and contains many angular rough seeds.

There are several varieties, both as respects the form of the leaves and the colour of the flowers.

Habitat. The Spigelia is a native of the southern, and south-western states, where it is very abundant in particular spots. It was formerly found as far north as Baltimore, but has been extirpated by the industry of collectors; it has even become rare in Virginia. It has never been found wild to the north of Pennsylvania, of which Muhlenberg mentions it as a native; it, however, thrives luxuriantly in gardens, especially at Colonel Carr's (Bartram's) botanic garden, Kingsessing. Whilst on this subject it may be proper to notice an error, or rather a tissue of errors, committed by a writer of a "natural history tour in North America," in Loudon's Magazine of Natural History, &c. for March 1831. This author states, "the pink root, (Spigelia Marilandica) was common, and in full bloom [among the rocks of the Palisades on the Hudson, above New York]. This plant has long been known in medicine as a vermifuge, and at one time acquired great celebrity; but, like every thing else, was overrated. It has lately fallen into disrepute, and is now but seldom used. It is, however, an elegant plant; grows most luxuriantly in the shade from the chinks and shelves of moss-covered rocks, where there is scarcely the appearance of earth; and from its spreading, bright red flowers, forms a relief, and an agreeable contrast to the gloom which mostly surrounds it." This information may be as new to our botanists, as his discovery of the Gigantic Sun-fish (Tetrodon mola) in the small lake forming the principal source of the Hackinsack river, near Vredideka Hook, will be to our ichthyologists.

The Spigelia grows in rich dry soils, on the borders of woods, and flowers from May to July, ripening its seeds late in the autumn.

Bot. History. This plant was known to botanists at a very early period, and was considered by them, and even by Linnæus at one time, as a species of Honeysuckle, but he afterwards very properly erected it into a new genus, which he dedicated to Adrian Spigelius, a learned botanist and anatomist, who was born at Brussels in 1578, and died at Padua in 1625, where he was professor of anatomy and surgery; his principal botanical work was "Isagoges in rem herbariam," published in Leyden in 1633.

There are several other species of this genus, natives of America, viz. *S. anthelmia, S. hamelliodes, S. peduncularis* and *speciosa.*

Med. History. The Carolina pink-root appears to have been known to the aborigines as a vermifuge of considerable power, and was in domestic use among the early settlers in the southern states a long time before it attracted the notice of the medical public. About the same time, however, it was brought into notice by Drs Garden, Lining and Chalmers of Carolina, and from the information they promulgated with respect to it, it became generally employed, and has since maintained a high rank as an anthelmintic.

Medical Properties. The pink-root is principally prescribed for the expulsion of the round worm or lumbricus, and is perhaps more generally used than any other of our native articles of the anthelmintic class. The whole plant is possessed of active properties, but the root is usually employed as being the most powerful; and this is most striking when in a recent state, as there is no article which deteriorates by long exposure to the air, in a more remarkable degree than the pink-root, and to this may, in all probability, be attributed the contradictory accounts that have been given of its qualities. In conjunction with its anthelmintic powers, it sometimes acts as a purge, and some writers have attributed all its virtues to the production of this action; this however is evidently erroneous, as it manifests its peculiar power on the worms, in many cases, without exciting an increased action of the intestinal tube, and hence the usual practice of prescribing a purge

after the exhibition of Spigelia. It is far more probable that its efficient vermifuge qualities are dependent on the same principle inducing the narcotic symptoms to which it occasionally gives rise. These are, dimness of sight, giddiness, dilated pupil, spasmodic motions of the muscles of the eyes, and even convulsions. Dr Chalmers attributes the loss of two children, who died with these symptoms, to the use of this article. Dr H. Thompson, who made it the subject of an inaugural dissertation, states, that the effects of large doses on himself, were, acceleration of the pulse, flushed face, drowsiness, and stiffness of the eyelids. The best account, however, of its narcotic powers, is given by Dr Eberle, who observes: "A boy about six years old, after having taken three or four gills of a strong decoction of the root, was suddenly affected with complete mental derangement. The derangement was precisely of that kind, which is sometimes produced by the seeds of stramonium. He distorted his countenance into a variety of shapes, was affected with alternate fits of laughing and crying, and ran and skipped about the room incessantly. The pupils of his eyes were greatly dilated, and his talk was wild and incoherent. These symptoms went off in about twenty hours, and left him as well as before he took the pink-root." These narcotic effects, following the ingestion of the Spigelia, have been thought by some to depend either on the roots of another plant gathered with the pink root, or on some parasitic vine which had attached itself to it, rather than to any inherent quality of the remedy. These ideas, however, are wholly erroneous; the small black fibres, which were supposed to appertain to the noxious plant, having been proved by Mr Elliot to be nothing more than decayed roots of the Spigelia itself; and the suggestion of those symptoms arising from the admixture of some parasitic vine is too futile to need refutation, more especially as the narcotic properties are more powerful in the roots than in the stems or leaves of the pink-root.

Its use has not been solely confined to cases of worms. As early as 1763, Dr Garden, in a letter to Dr Hope, of Edinburgh, states that he had given it with great success in febrile dis-

eases, which seemed to arise from viscidity in the *prima via*, even where there were no worms voided; this is confirmed by Dr Ives, and in fact, almost every practitioner must have met with instances of its efficacy in those febrile attacks of children, generally known under the name of worm fever, which in a number of cases are induced by irritation of the bowels from other causes than the presence of worms. Of this character is the protracted remittent, with hydrocephalic symptoms, in which the late Dr B. S. Barton, found the Spigelia of service. Rafinesque states that it is used among the Osages as a sudorific and sedative in acute diseases.

Pharm. Preparations and Mode of Administration. The Spigelia may be given either in powder or in infusion. The dose of the powder for children is from ten to twenty grains. The infusion, however, being somewhat mucilaginous, and having a sweetish taste, is more readily taken by children. This, as directed by the U. S. Pharm. is,

℞.—Spigeliæ ℥ss.
Aquæ bullientis Oj.

Macerate for two hours in a covered vessel, and strain.

This infusion we think is too weak, requiring too large a quantity of the inert menstruum to be taken; the usual prescription is exactly double the quantity of the root. Of this latter infusion, a wineglass full is to be taken at a dose by a child, and a half pint by an adult. One of the best modes of administering it we have found, is to give a large dose of the infusion to a child at bed time, and to exhibit a mercurial or other effective purge in the morning.

Some practitioners prefer giving it combination. Dr Garden, already quoted, and others recommend it in union with the *Aristolochia serpentaria*, not only as adding to its efficacy, but also as counteracting its narcotic qualities.

The most common combination, however, is with some of the purgatives, and especially with Senna; this forms a very celebrated and efficacious nostrum, called worm tea, for which there are several recipes, differing slightly in the quantities

of the different ingredients, or in the omission of one or more of them; one of them which is much used is,

℞.—Spigeliæ	℥ss
Sennæ	℥ij
Sabinæ	℥ss
Mannæ	℥ij

Infuse in a pint of boiling water, and strain.

The dose of this compound infusion is much the same as directed for the simple; it generally purges actively, and does not appear to excite the narcotic symptoms as readily as the latter.

A variety of other formulæ for the exhibition of this medicine, are given in the *Pharmacopée Universelle*, of which the following are the most important.

Decoctum Spigeliæ.

℞.—Spigeliæ anthel.	℥ij
Aqua fluvial.	℔ij

Boil and add, after straining,

Suc. limon. recen.	℥vi
Syr. flor. pers.	℥ij
Aqua	℔ij

Dose one or two ounces every six hours for an adult.

Syrupus Spigeliæ.

℞.—Fol. Spigel.	℥ij
Sem. Anisi contus.	℥ss

Infuse for 6 or 7 hours in a water bath, squeeze and filter, and then add

Extrac. jalapæ	℥ss
Sacch. alb.	℥i

Dose, two tea spoonfuls a day to children, a table spoonful night and morning to an adult, in half a cupful of some appropriate vehicle.

Analysis. M. Feneulle, of Cambray, analysed some specimens of a Spigelia, in 1803, which he supposed at the time to be the *S. anthelmia*, but the authors of the "Dictionnaire

des Drogues," are of opinion that he was mistaken, and that the subject of his researches was the *S. marilandica;* this idea is confirmed by an observation he makes at the commencement of his memoir, that the article under consideration is employed in the United States; now it is well known that whilst the indigenous species is universally employed, the *S. anthelmia* is scarcely known even by name. We will therefore extract such parts of his paper as appear interesting, as a guide for those who may wish to pursue the subject.

1. A portion of the roots, reduced to powder, were subjected to the action of sulphuric ether until every thing soluble was taken up; the etherial tincture was of a lemon colour, and reddened litmus paper; when distilled to about a sixth, a liquid remained in the retort, which was left to evaporate spontaneously; the ether did not appear to have contracted any particular odour, and no longer reddened litmus paper; the residue, on the contrary, had strong marks of acidity; on diluting it with distilled water, a soft, fat, unctuous substance was separated of an acrid taste, accompanied with a small portion of resin. The aqueous solution precipitated the salts of the peroxide of iron of a black colour; it contained gallic acid, accompanied with a bitter substance.

2. The roots treated with ether, were boiled with rectified alcohol; this liquid, on being filtered, deposited nothing on cooling; on distilling it, a residuum was obtained, formed of resin, an oil of a greenish colour, a little acid, and a bitter substance.

3. A fresh portion of roots were macerated in distilled water for some hours; on filtering a part of this infusion, and boiling it, an inconsiderable coagulum was formed, which burnt like animal matter, was soluble in potash, and which was found to be albumen. The remainder of the infusion was distilled, and afforded a product of an aromatic odour, slightly nauseous, not affecting litmus paper, but occasioning a cloudiness in solutions of acetate of lead and nitrate of silver; the decoction remaining in the retort, on being filtered, remained perfectly transparent; its colour was brown, its taste bitter and

astringent. Acetate of lead, on being added to it, occasioned a yellowish white precipitate, which being collected on a filter and well washed, was suspended in distilled water, and decomposed by sulphuretted hydrogen; filtered and evaporated to dryness, the residue treated by alcohol, gave a white soluble matter having acid characters, being in fact an acid malate of lime, &c.

The decoction, freed from the precipitate formed by the acetate of lead, was deprived of the excess of this salt, by hydrosulphuric acid, filtered to separate the sulphuret of lead and evaporated to dryness; on treating this extract with alcohol, a coloured substance of a sweetish taste, soluble in water, &c. was left, and the menstruum took up a matter, having a bitter taste, and of a brownish colour, which appears to be the active principle of the Spigelia. Taken internally it occasions vertigoes which last for some hours, and is purgative.

It results from this examination that the roots of the Spigelia contain

A fat oil,
Volatile oil,
Resin in very small quantity,
A bitter substance in which the vermifuge power appears to reside,
Muco-saccharine matter,
Albumen,
Gallic acid,
Malates of lime, potash, &c.
Woody fibre.

M. Fenuelle, also analysed the leaves; these gave much the same products, except that there was a notable proportion of chlorophylline and less of the active bitter substance.

Article II.—*Pharmaceutical Notices, No.* 3.

[We are happy to find this department of the Journal is attracting attention, as a proof of which, it will be seen, that the following notices are derived from two different sources. For the latter part we are indebted to a distant correspondent, who we trust will redeem the promise which he has made of furnishing an account of the value of the different processes for the extraction of morphia.]

To many readers of the Journal of the College of Pharmacy, the short essays which have recently appeared under the above head have doubtless been gratifying. These essays will form a vehicle for the interchange of practical experience, and the communication of many small matters, which are of real importance to the professors of an art depending so much, as does that of pharmacy, on little items of accuracy and precision of manipulation. The editor will allow me a remark or two on the last number of this series (vol. iii. pp. 290, 291); and a few observations on the subject of emulsions generally, which I shall endeavour to condense from the rough notes made at various times, as the occasions occurred.

The *coagulation* of the *mixture of Epsom salts*, magnesia, tincture of colchicum, &c. mentioned on page 290, is an instance of what I have frequently observed to take place in mixtures containing magnesia with a vegetable tincture. I may instance in particular, a mixture of assafœtida with magnesia, commonly known as Dr Dewees's Carminative; which, after standing a few days, frequently becomes as solid as butter. This, however, does not occur so readily, when made with calcined magnesia, as when the carbonate is employed. The first instance of this change, that I remember noticing, was a mixture of Epsom salts, magnesia, tincture of jalap, and infusion of senna; which, after standing a day or two, became completely gelatinous, so as to induce a suspicion, in the mind of the patient, of some inaccuracy in the preparation of the pre-

scription. Can this be the result of any change effected in the constituents of the tincture, similar to the effect of magnesia on copaiba balsam? It seems to merit further investigation.

Your correspondent in the same paper, on the subject of *emulsions*, says that, "as a general rule, the mucilage should be made about the thickness of the substances we wish to suspend." My own experience does not agree with him here, and I cannot think well of this direction as a general rule. If the mucilage is to be made of the same thickness as the substance to be suspended, it may answer very well with castor oil, copaiba balsam, and some others; but how shall we manage, when we wish to suspend oil of turpentine, or camphor, or ether, or myrrh, or almonds, or gum ammoniac, or oil of aniseed, or assafœtida, all of which are frequently ordered in the form of emulsion? In these cases the mucilage should not surely be of the same consistence as the substance to be suspended.

Where the substance we wish to suspend is fluid, the mucilage, or other matter intended to serve as a suspensory, should be of a consistence between common syrup and molasses. The white of egg, which is often ordered here by physicians, is seldom sufficiently viscid; and indeed I have sometimes found it impracticable to form a perfect emulsion with it, without the addition of a small quantity of powdered gum arabic. The *vitellum*, which is thicker than the white, makes a more perfect emulsion; and where the mixture is not likely to be kept more than twenty-four hours, and the circumstances of the patient would not render its exhibition improper, it is decidedly preferable. A thick mucilage of gum arabic, however, such as the *mucilago acaciæ* of the United States Pharmacopœia, consisting of four ounces of gum to half a pint of water, appears to me to be the best article in common use for the suspension of oils.

In making an emulsion, a good deal depends even on so slight a circumstance as the form and material of the mortar and pestle. An emulsion may, indeed, be made in a smooth porcelain mortar; but the process is unquestionably more successful and easy in a wedgwood one, and still more so in the old-fashioned

marble mortar which is generally used to this day by the druggists and apothecaries in England. But whatever be the composition of the mortar, it is essential that it should be perfectly *round* at the bottom; not flattish, as is sometimes the case; and the pestle should be so formed as in its motion to leave no hollows between its base and the concave surface of the mortar. Otherwise the emulsion will most probably be imperfect. The mucilage or other viscid substance should always be put into the mortar before any thing else: the oil (or balsam) may then be very gradually rubbed in, taking care to add it no quicker than it can be subdued by the pestle, and if, during this part of the manipulation, the mixture should begin to assume a breaking or curdling appearance at the edges, a few drops of water must be immediately incorporated with it, before adding the remainder of the oil. For want of this precaution I have often known an emulsion suddenly to lose its tenacious consistence in the mortar, and it is then in vain to endeavour to restore it. After the oil is thoroughly incorporated, some care is requisite to avoid separating it again by too hasty an effusion of the water or other fluid of the mixture; and if any alcoholic or acid liquid is to be added, it must be at the very end of the process. Indeed an acid liquid, even a slightly acescent syrup, will often entirely destroy the emulsion. Mixtures of copaiba are frequently spoiled by the addition of Spir. Œth. nit.; which might be avoided by first diluting it with one or two portions of water.

Sulphuric Ether is sometimes ordered by physicians to be dissolved in water by first rubbing it with a little spermaceti. This latter substance of course afterwards floats on the surface of the water and requires straining off; and whilst the mixture is thus exposed to the air, a portion of the ether evaporates. This might be in great measure avoided, by rapidly filtering the mixture through *good* filtering paper, keeping the funnel closed at the top.

Oil of Turpentine may be suspended by rubbing it in water with magnesia; but the emulsion thus formed is neither so complete nor so permanent as that obtained by the use of gum arabic.

Two drachms of gum, rubbed up carefully with half a fluid ounce of oil of turpentine and two ounces of water, makes a beautiful milk-white emulsion, which does not soon separate. I have kept a mixture, made in these proportions, upwards of twelve months, at the end of which period it appeared as good as when recently made.

Spermaceti may be made into a pretty good emulsion by the assistance of mucilage or *vitellum ovi* and sugar, but is apt to separate by standing. Myrrh, gum ammoniac, and assafœtida emulsions, are best when rubbed down very carefully and gradually with water only; by which means they make a whiter milk than when gum or sugar is used in the process, and the impurities may then be readily separated by decantation. The powdered myrrh should never be taken for emulsions, but the richest, most fatty pieces of the fresh drug.

Camphor is a medicine of so great value to the physician, in cases where speedy efficiency is requisite, that it is to be regretted it should be so often ordered wrapped up in the untractable form of a hard pill. In cases where a large dose is to be taken, a good form is the emulsion prepared by rubbing down one drachm of camphor in two ounces of water by means of ten grains of the best Turkey myrrh. The most elegant, however, of all the forms in which camphor can be exhibited, and probably also the most efficient, is its actual solution in water. It is well known that water simply poured on the powdered camphor, as directed by the London Pharmacopœia, takes up only a very small portion, barely sufficient to impart a flavour. By friction with magnesia, and subsequent filtration, a much larger quantity is dissolved. I have taken some pains to ascertain its solubility, and the various circumstances by which this is modified. I find that when the directions of the London Pharmacopœia are followed, one pint of water takes up only thirteen grains of camphor. One pint of water, however, at a common temperature, rubbed with two drachms of camphor and twenty grains of calcined magnesia, dissolves fifty grains. When one drachm of magnesia is employed, (which is the

proportion adopted by the United States Pharmacopœia,) the quantity dissolved is the same. One pint of water rubbed with carbonate of magnesia dissolved only thirty-five grains; but with prepared chalk fifty-three grains were dissolved.

W. HODGSON, JUN.

Rochelle Salts. The last edition of Coxe's Dispensatory gives the following formula for making Rochelle salts. "Take of subcarbonate of soda, 20 ounces; supertartrate of potass two pounds; boiling water 10 pints; dissolve the carbonate of soda in the water, and gradually add the supertartrate of potass, filter the solution through paper, evaporate until a pellicle be formed, and set it aside to crystallize, pour off the liquor and dry the crystals on blotting paper."

There is a great deal too much said here, for it is not necessary to filter through paper; if as much water as ten pints be used to dissolve the subcarbonate of soda, it will subside much quicker than it can be filtered; and it is impossible to crystallize Rochelle salts, if the solution be evaporated until a pellicle appears, for in this case, (if it does take place at all) the salt would be completely decomposed. The proper mode is to evaporate until a drop, when allowed to cool on a plate of glass, presents a well defined crystalline group; I say well defined, for if the appearance be at all confused, the solution has been too much evaporated, and fine crystals cannot be obtained. This salt is often adulterated, when in powder, with sulphate of soda; this, however, may be readily detected by muriate of barytes; occasionally it is sophisticated with muriate of potass, which can be discovered by calcining the salt, dissolving in distilled vinegar, and adding nitrate of silver, which precipitates the chloride.

Nitrate of Silver, is frequently adulterated with nitrates of potass and of lead; to detect the former, mere inspection is sufficient, as the genuine article is somewhat transparent, and

when broken, presents the appearance of crystalline radii emanating from a common centre, whereas, if nitre has been added, it will give a compact stony fracture, having no appearance of crystallization. If nitrate of lead has been added, a white precipitate will occur on adding an excess of caustic ammonia to its solution. If copper be present, it will be deliquescent, which it never is in a pure state.

Sulphate of Morphine. This valuable article is frequently adulterated with sulphate of quinine, and as many druggists consider it to be better on account of its insolubility, and from its requiring the addition of an acid to dissolve, this notice may induce them to suspect it, if it be not perfectly soluble in double its weight of water. To detect its adulteration, form a saturated solution of sulphate of quinine, by boiling it in distilled water; weigh out ten grains of the sulphate of morphine, place it on a filter, and pour on it the solution of the sulphate of quinine as long as a drop, when filtered, strikes a red colour with nitric acid, the insoluble residue will be sulphate of quinine or other impurities, but most likely the former, from its resemblance to the sulphate of morphine, inducing its use for the purpose of sophistication. In many samples of what was termed genuine and imported from France, from 15 to 25 per cent of the sulphate of quinine have been detected.

Iodides of Mercury. If a small quantity of iodine and metallic mercury be triturated together, till an impalpable powder is formed, and the mixture be introduced into a long glass tube and subjected to a moderate heat, a sublimate of a bright scarlet, and one of a brilliant yellow will result; if the yellow product be pressed firmly against the side of the tube by means of a glass rod, it will immediately change into a bright scarlet; if the portion which has thus been changed, be boiled in common alcohol, it will resume its yellow colour, and if again pressed even on paper, it will again change to a scarlet, satisfactorily proving, at least to me, that the yellow and red iodides of mercury are identical in composition, and that they

owe the difference of colour which they present, merely to a different crystalline arrangement of their particles.*

Morphine. I am manufacturing this article largely, and have subjected twelve pounds of opium to each of the various modes recommended, as I had previously done with ounces, which I consider too small a quantity to give a satisfactory comparison. Meanwhile, I can state with certainty that the plan advised by Dr Staples is the most expensive, that of Robiquet the most productive, and that of Faure the most easy. On the termination of my experiments on a large scale I will, however, transmit fuller details on the processes and their results.

Tartaric Acid. The following method of making tartaric acid, answers extremely well on a small scale, but I have not yet tried with large quantities. To finely powdered bi-tartrate of potass, add one fourth of its weight of sulphuric acid and rub it up into a paste, so as to incorporate the ingredients thoroughly, adding merely a sufficient quantity of water to form an uniformly tough mass. Put this into a linen bag, and pour on it cold distilled water, as long as the droppings will redden litmus paper. Evaporate slowly and crystallize. Sulphate of potass remains in the bag. The solution must be tested to prove the absence of any excess of sulphuric acid, by a solution of acetate of lead, and the precipitate thence resulting must be entirely soluble in dilute nitric acid.

* The above observations of our valued correspondent, on the iodides of mercury are extremely interesting, and at first view, would certainly seem to corroborate the inference he has deduced, though this is an erroneous one. Dumas, in speaking of the bi-iodide, or red iodide of mercury, says, "this compound is of the most brilliant red colour. It is fusible and volatile; but its fumes condense in spangles or in dust of a yellow colour. This, after some time, regains its red colour. The least friction suffices to restore it to its natural appearance immediately. It is very probable that the yellow and red states depend on some isometrical phenomenon which requires a close examination." Our correspondent likewise mentions the change of colour which takes place on the red coloured bi-iodide being boiled in alcohol, but does not say whether it was soluble or not, which would have settled the question of identity, as the sesqui or yellow iodide is insoluble in that liquid, whilst the bi-iodide is taken up by it.—Ed

A very beautiful acid may be more expeditiously, but more expensively made by substituting diluted alcohol for the water in the above process. A.

ARTICLE III.—*Notes on Hydrocyanic Acid. By R. Eglesfeld Griffith, M.D.*

There is perhaps no medicinal preparation, on which so little reliance can be placed, as on that of hydrocyanic acid; this arises from many causes, the chief of which are, want of uniformity in the mode of making it, and its liability to spontaneous decomposition, even when protected from solar and atmospheric influences. As, however, the most ample proofs have been afforded of its remedial powers, in a variety of diseases, it is important that the best of the several methods which have been devised for its preparation, should be adopted, and all others wholly laid aside; at present one Pharmacopœia orders the acid made according to Scheele's process, another enjoins Gay Lussac's preparation, diluted to a certain degree, whilst a third gives that of Vauquelin as the best.

In this state of things, we have thought that a condensed view of the subject might not prove uninteresting, although claiming no stronger title to originality than the mere arrangement of the materials, which have been collected from a variety of sources, but principally from the recent papers of Berzelius, Vauquelin, Robiquet, &c.

The first who obtained the hydrocyanic acid in a separate form, was Scheele, about 1780, during a course of experiments on the nature of Prussian blue.

Process of Scheele.—To 128 parts of Prussian blue (ferrohydrocyanate of iron) and 64 parts of the red oxide of mercury (peroxide) are to be added 500 parts of distilled water, and the whole put into a capsule and boiled for twenty minutes,

constantly stirring the mixture with a wooden spatula; it is then permitted to settle, filtered, and the precipitate washed with 128 parts of boiling water; the two fluids are then to be mixed and poured into a matrass, and 96 parts of finely powdered iron scales and 24 parts of sulphuric acid at 66° added to them. The mixture is to be well shaken, and the vessel plunged into cold water for an hour. The fluid is then to be decanted into a tubulated retort placed in a sand bath; to the neck of the retort is to be attached an adapter which is connected with a tubulated globe, from which proceeds a bent tube, the extremity of which is plunged into a vessel containing water. The apparatus must be well luted, and the globular receiver covered with wet cloths; a gentle heat is now to be applied until 192 parts have passed over. To this liquid is to be added eight parts of carbonate of lime, and it is to be again distilled: this will afford 128 parts of acid.*

The disadvantages of Scheele's acid are, from the difficulty of uniting the same circumstances in every operation, that there is never a decided proportion of real acid to the water with which it is mixed, and its extreme liability to decomposition.

Scheele's experiments were repeated, and greatly extended by Berthollet in 1787; from this time to 1806 but little additional light was thrown on the subject, when Proust, in a series of well conducted investigations on both the acid and its compounds, enriched chemistry with a great number of new and important facts, which paved the way for the subsequent discoveries of Gay Lussac, who was the first to lay before the world an easy process by which the acid might be obtained in a pure and concentrated form.

Process of Gay Lussac.—Put into a small tubulated retort, a mixture of cyanide of mercury and hydrochloric acid, the quantity of acid being less than is requisite to decompose the cyanide completely. To the beak of the retort is to be fitted

* Scheele's Chemical Essays.

a glass tube about two feet long, and six-tenths of an inch in diameter; the third of this tube nearest to the retort, is to be filled with small fragments of white marble, to retain any hydrochloric acid that may pass over, which, however, is to be as carefully guarded against as possible; the remainder of the tube is to be filled with chloride of calcium, in order to absorb any aqueous vapours. To the extremity of the tube is to be adapted a small receiver, which is to be surrounded with ice or a freezing mixture. A gentle heat is to be applied to the retort, when the hydrocyanic acid will pass over and condense, first on the marble, from which it is to be disengaged by heat and gradually driven along the tube into the receiver.*

This process will afford a pure acid, but much too powerful for medicinal purposes. Magendie has therefore directed in his formulary, that it should be mixed with six times its volume or 8.5 times its weight of distilled water. This process of Gay Lussac has been adopted with some variations by Robiquet; after, however, having obtained the acid, which has a density of 0.7, he orders it to be diluted with two parts of water only, thus forming a medicinal acid of the density of 0.9.

This difference of the medicinal hydrocyanic acids of these two chemists should always be borne in mind, as fatal consequences might result from using them indiscriminately, or in the same doses. The disadvantages of both Gay Lussac's and Robiquet's processes are, that the preparation of the anhydrous acid always exposes the operator to some danger, and that the products are so readily decomposed; at the same time, by adopting one or the other as a standard of strength, we are enabled to administer a definite quantity, which can never be the case, where Scheele's acid is employed. Magendie states that the French physicians consider this as so much weaker than the medicinal acid of the codex (Magendie's), that they often order it to the amount of a drachm to a mixture of four ounces, to be taken in spoonful doses; and the Parisian apo-

* Ann. de Chim. t. 68, p. 128, and t. 95, p. 136.

thecaries are so accustomed to see Scheele's acid entering in large quantities into the composition of medical prescriptions, that, in order to prevent accidents, they prepare their acid by mixing that of Gay Lussac with forty parts of water. This dilution admits of their making up prescriptions without danger, when they find, by the extent of the dose ordered, that the physician meant Scheele's acid.*

Process of Vauquelin.—Take one part of cyanide of mercury, and eight parts of distilled water, dissolve, and pass a current of hydro-sulphuric acid gas through the solution, till there is an excess of the acid. Filter to separate the sulphur which is deposited, and add a sufficient quantity of carbonate of lead, finely powdered, to saturate the hydro-sulphuric acid, agitate the mixture, and filter, when the hydro-cyanic acid will be obtained, of the same density as that by Scheele's process.† This plan is adopted by the United States Pharmacopœia and others, but has the disadvantage of not giving a preparation of an invariable strength. A modification of this process has been proposed by M. Caillot; which is to employ only four parts of water instead of eight, and to add to the acid four parts of alcohol at 40° to replace the four parts of water omitted. This modification was to obtain a preparation which would keep for an indefinite period.

Process of Van Mons.—Dissolve thirteen parts of cyanide of mercury in water and introduce the solution into a tubulated retort containing three parts of iron scales; pour on the mixture ten parts of sulphuric acid, diluted with three times its weight of water; stir with a wooden spatula till all the mercury is separated; place the retort on a sand-bath, and heat to ebullition; distil off 117 parts, and rectify by another distillation.

This is by no means a good plan, as it always gives an acid mixed with variable proportions of water.‡

Process of Gea Pessina.—Take hydro-ferrocyanate of po-

* Magendie's Formulary, translated by J. Houlton, 1828.

† Pharmacopée Universelle.

‡ Ibid.

tassa, eighteen parts, introduce it into a tubulated retort, the beak of which is connected with a very small tubulated receiver, provided with a safety tube, the extremity of which is inserted in a vessel containing a little distilled water; add a mixture of sulphuric acid of 66°, nine parts, and distilled water twelve parts. After a reaction of twelve hours, during which the receiver must be constantly kept surrounded by ice, the retort is to be gently heated; the fire is to be extinguished as soon as a blue matter is formed, which threatens to pass into the receiver.*

According to the observations of Henry, Jun., this preparation is easily preserved, and by diluting it with sufficient water to give it a density of 0.980, it will be of the same strength as that ordered by Magendie, with the advantage of being much more readily obtained and capable of being kept for an indefinite time without alteration.

Process of Trautwein.—Introduce 15 ounces of hydrocyanate of potassa in powder, into a tubulated retort placed in a sand bath, and adapt it to a receiver plunged in a frigorific mixture; nine ounces of sulphuric acid diluted with an equal weight of water are to be poured on the salt, the apparatus luted, and the mixture distilled by a gentle heat. This will give four to five ounces of hydrocyanic acid diluted with water. This acid is to be poured into a strong bottle placed in the frigorific mixture, and dry chloride of calcium gradually added, till a liquid mass is formed, on the surface of which an etherial fluid may be perceived; this fluid is to be separated, and a little more chloride of calcium added, when it is to be distilled, with the same precautions as before. This gives an acid of 705° to 710°, which, when diluted with six times its volume or eight and a half times its weight of distilled water, will give a medicinal acid of 0.982. Mr Trautwein states that the pure acid can be preserved for nine months, without any alteration.†

* Journ. de Pharmacie, t. 9, p. 15.

† Ibid. p. 239.

The German and Batavian Pharmacopœias contain several formulæ for the preparation of alcoholic hydrocyanic acids, of which we have space for two only.

Process of Keller.—Take four parts of hydroferrocyanate of potassa, dissolved in sixteen parts of distilled water, and add a mixture of three parts of sulphuric acid of 66° and twelve parts of alcohol; permit the whole to digest in a gentle heat, stirring it often; decant the limpid portion, and distil in a retort, till the product has twenty times the volume of one part of water. The density of this acid is 0.900.*

Process of Ittnerr.—Take hydroferrocyanate of potassa, four ounces; introduce it into a retort and add a mixture of sulphuric acid of 66° two ounces, and water four ounces. Distil, almost to dryness, into a receiver containing pure alcohol, eight ounces. Digest the product for some hours on a drachm of calcined magnesia, and distil off six ounces, which are to be received into a vessel containing two ounces of rectified alcohol.†

Notwithstanding the alcohol in this preparation, it is liable to decompose; it is, however, stated by M. Schutz, that if, when it begins to turn yellow, it again be distilled over calcined sulphate of zinc, that a colourless acid is obtained which is of great strength and will preserve its qualities for years.‡ Besides these methods for the preparation of the acid of various degrees of strength, we have lately been presented with others to obtain it without distillation, by decomposing some of its salts. The first to propose this was Mr Clark of Glasgow, whose paper on the subject will be found in our last number. This method, as will be seen, consists in dissolving one drachm of tartaric acid in an ounce of water in a bottle, adding twenty-eight grains of cyanide of potassium, closing the bottle and shaking well, &c. This preparation, he says, corresponds with the strength of Vauquelin's acid, that of Magendie being four times as strong. This plan of Mr Clark's has been slightly

* Pharmacopée Universelle.

† Ibid.

‡ See Journal of Pharmacy, Vol. I. p. 235.

modified by Mr Laming of London, whose formula will also be found in our last number.

At the first glance, this mode would appear to offer great advantages; the acid could be made as it was wanted, and of a definite strength; but on a closer examination of it many difficulties of no slight character present themselves; these are fully stated by Mr Robiquet in his report to the Parisian School of Pharmacy; on Mr Clark's process,* he observes, "is it always the fact, as Mr Clark supposes, that by closely adhering to this formula, that a medicament is obtained which is always identical and equal to the acid prepared according to other processes. Mr Clark adds to the cyanide of potassium only the exact quantity of tartaric acid necessary to transform all the potassa into a bitartrate, but who is ignorant that these kinds of decompositions are seldom complete, and that, with very few exceptions, they require an excess of the precipitating body, especially when the precipitate is not wholly insoluble. It is therefore more than probable that a portion of the cyanide of potassium remains unaltered in the solution, besides a portion of tartaric acid and bi-tartrate of potassa." But the greatest objection in M. Robiquet's opinion is the want of purity in the cyanide used, for if prepared according to the plan proposed by Mr Clark, it will seldom be identical, and will in fact be always more or less mixed with subcarbonate of potassa, from the prompt alteration of the cyanide when it comes in contact with water. If this be the case, as is most probable, the great value of Mr Clark's process is destroyed, that of affording a medicine of invariable strength and not subject to those alterations to which the hydrocyanic acid procured by the former methods is always liable.

If Mr Clark's plan be employed, it is of great consequence that the cyanide of potassium be perfectly pure. As commonly found, it is black and mixed with carbonaceous and ferruginous matter, as this is the only mode in which it can be kept in an unaltered state for any length of time; this is no disadvantage

* Journ. de Pharm. Nov. 1831.

when used for the preparation of hydrocyanic acid by distillation, instead of the cyanide of mercury, as recommended by Gay Lussac; but is of the most vital importance if employed to make the medicinal acid of Mr Clark. Besides the mode of obtaining it given by the latter, several others have been proposed, among which those of Robiquet and Tilloy appear to be the best. Robiquet observes, "to obtain it pure, I fuse the impure cyanide perfectly; by keeping up this fusion for some time, a portion of the cyanide of potassium will float over the iron and charcoal will occupy the bottom of the retort. After cooling, I detach this layer with care; but this cyanide, the only one which is really pure, and which alone should be employed in medicine as a substitute for the hydrocyanic acid; this cyanide, I say, is too dear, and it was requisite to form a salt which should be at the same time white and cheap. To fulfil these two conditions with as little alteration of the salt as possible, I dissolve the impure cyanide in a very small portion of water, which produces a great diminution of temperature. I filter, and immediately and rapidly evaporate to dryness, in a platina capsule, and when the whole is reduced to dryness, increase the heat till it fuses."

Tilloy prefers calcining the ferro-hydrocyanate of potassa, separating the cyanide of potassium from the quadricarburet of iron by absolute alcohol, on distilling which the cyanide of potassium is obtained very pure and white. His reason for using absolute alcohol, is because he supposes that a complete decomposition of the cyanide of potassium takes place when it is dissolved in water. This is denied by Robiquet, who asserts that the reaction is slow, and stops at a certain point. He says that he has kept very weak solutions of it for several months, without the whole of the cyanide being decomposed.

From the above it will be perceived that all the processes hitherto devised are attended with certain drawbacks; some give an acid of variable strength, others an acid which, although pure, is extremely liable to decomposition, and that the plans for making it extemporaneously are also defective in the same

important particulars. The best appear to be those of Vauquelin, Robiquet and Gea-Pessina; but the most desirable point connected with the subject, is, that all the Pharmacopœias should adopt one of the modes, and that acids made by any other should not be prescribed. In the present state of things, when each druggist's shop may be provided with an article made by a different process and varying in strength, a physician should carefully note in his prescription which of the acids he intends, or fatal consequences might ensue, without any blame attaching to the apothecary. It is stated in the *Dictionnaire de Matiere Medicale* of Merat and De Lens, "that, at the central Pharmacy (at Paris) they only prepare the acid of Scheele, and consequently in the hospitals, even where the medicinal hydrocyanic acid is prescribed, no other is used."

Since writing the above we have met with another mode of preparing a medicinal acid, devised by Mr Tilloy, which will be found in the Miscellany. This article he states is of invariable strength, and is not altered by age.

Article IV.—*On the Anda Gomesii. By Franklin R. Smith.*

Some time since, a small quantity of oil, with specimens of the nuts from which it was obtained, both in a perfect state and also powdered, was sent to this city from Rio Janeiro by Dr Ruschenberger of the United States navy. As this is probably the first that has reached this country, it is hoped that a short notice of the tree and its products may not prove uninteresting.

The account transmitted with those articles, stated that the nuts were the fruit of the *Joannesia princeps*, a large tree belonging to the natural order Euphorbiaceæ, growing in the

botanic garden at Rio Janeiro, having a whitish bark and rising to the height of 40 or 50 feet. Like many other medicinal plants, however, great confusion has existed in its synonymes. From the limited investigation we have been able to make respecting it, it appears that it was described by Piso in his Hist. Nat. Brazil, in 1618, under the native name of *Anda.* Margrave, who also wrote on the productions of that country, likewise notices it, but figures a different plant. So little additional information was obtained respecting it until the time of Gomez, that it is not described by Linnæus; and Jussieu in his Gen. Plant., observes, that in all probability it is analogous or identical with *Aleuteris.* By Gomez it was erected into a genus under the name of *Joannesia,* which, however, was changed by A. Jussieu into that of *Anda,* its original appellation, as the former was preoccupied by a genus of Carduaceous plants. This uncertainty and confusion is remarkable, as the tree appears to have attracted the attention of travellers in no slight degree, from its beauty and the medicinal properties attributed to it. Piso terms it "arbor vasta atque elegans."

The bark is lactescent and poisonous, and a decoction of it is used by the natives for the purpose of stupifying fish. The most important part, however, is the fruit; this is about the size of an apple, of an ash colour. Upon removing the external husk, a nut is presented to view, of a round form and about two inches in diameter. It has four elevated ridges arising from its insertion and produced at the opposite extremity into a sharp point. The lateral ridges are interrupted near the upper end of the nut by two fissures, one on each side of the acumination. The shell is hard and ligneous, and, when broken, exhibits two cells, each containing one seed, about twice the size of a chesnut, and furnished with a very hard brownish shell of one-fourth of a line in thickness.

These kernels are cathartic in doses of from one to three, and have been employed from time immemorial by the natives, who prefer them to any other remedy of the kind. The husk is commonly used as an astringent in diarrhœa, as well as to moderate the effects of an overdose of the kernels.

To obtain the oil, the kernels are decorticated, pounded in a mortar, and afterwards subjected to pressure. By this treatment, they yield a clear pale yellowish oil, destitute of taste and almost without smell; at ordinary temperatures it is as fluid as olive oil, and is used by the natives for burning, for painting, and for anointing their bodies.

As our accounts of its activity as a cathartic were vague and unsatisfactory, I was desirous of ascertaining its real value, and for that purpose placed it in the hands of Dr Norris, resident physician of the Pennsylvania Hospital, in order that a fair trial might be made of it. As the result of his experiments with it, it may be stated that in doses of 50 drops it generally induced one evacuation; in one case in which the dose was increased to 60 drops, several alvine discharges were the consequence.

Like the other remedies furnished by the Euphorbiaceæ, it will occasionally nauseate; in one patient, a female of a scrofulous diathesis, it produced copious vomiting, half an hour after its administration.

Article V.—*Notes on the Pharmacopœia of the United States. By Daniel B. Smith.*

As the Pharmacopœia of the United States for 1831 is winning its way to general adoption, and will probably be acknowledged as the standard throughout the Union, I have thought that a comparison between its formulæ and those of the British Colleges would be interesting. It will probably satisfy those who still hesitate about the propriety of adopting it, that there is not so great a diversity as they may have been led to expect. The following list comprises those preparations in which the formulæ agree with the London College.

Where the formulæ also agree with those of Edinburgh or Dublin, the letters E. or D. are affixed.

Ceratum Plumbi subacetatis.
Saponis.
Decoctum Cinchonæ, D.
Dulcamaræ.
Hordei, E. D.
Lichenis.
Sarsaparillæ Comp.
Senegæ, E.
Veratri.
Extractum Colocynth. Comp.
Ferri Muriatis Tinctura.
Infusum Angusturæ.
Anthemidis, E.
Armoraciæ.
Cascarillæ.
Cinchonæ.
Colombæ.
Lini.
Rhei.
Rosæ.
Tabaci.
Pilulæ Ferri Comp.
Hydrargyri, D.
Pulvis Ipecacuanhæ, Comp. E. D.
Syrupus Simplex.
Aurantiæ.
Limoni.
Confectio Amygdalæ.
Aurantiæ, D.
Rosæ, E. D.
Sennæ.
Emplastrum Ammoniaci, D.
Ferri.
Galbani Comp.
Plumbi.
Resinæ.
Linimentum Camphoræ, E. D.
Terebinthæ.
Mistura Ammoniaci.
Mistura Amygdalæ.
Assafœtidæ.
Ferri Comp.
Mucilago Acaciæ, E. D.
Spiritus Juniperi Comp. E. D.
Lavandulæ, E.
Myristicæ.
Pimentæ.
Tinctura Aloes Comp. D.
Assafœtidæ.
Benzoini Comp. D.
Camphoræ, D.
Cantharidis.
Capsici.
Castorei.
Catechu, D.
Cinnamomi.
Colombæ.
Digitalis, D.
Gentianæ, D.
Guaiaci.
Ammoniata, E. D.
Hellebori Nigri.
Humuli.
Hyosciami.
Jalapæ.
Myrrhæ.
Opii, D.
Scillæ, D.
Serpentariæ, D.
Valerianæ, D.
Unguentum Cantharidis,
Hydrargyri, D.
Oxydi, E.
Picis, D.
Sulphuris.
Veratri.
Zinci, E.
Vinum Opii, E.

The formulæ of the following list differ from the London and agree with those of the Edinburgh College. Those pre-

parations which are not ordered in the London Pharmacopœia are marked with an asterisk.

Ceratum Resinæ.
Cetacei.
Emplastrum Hydrargyri.
Assafœtidæ.*
Ferri.*
Oxymel Scillæ,* D.
Pilulæ Aloes.
et Assafœtidæ.*
et Myrrhæ.
Rhei Comp.*
Tinctura Cardamomi.
Rhei.
et Aloes.*
et Gentianæ.*
Saponis Comp.
Tolutani.*
Aqua Aurantii Corticis.
Rosæ.
Confectio Aromatica.
Infusum Gentianæ Comp.
Quassiæ.
Linimentum Calcis.* D.
Pulvis Aromaticus.
Spiritus Lavandulæ Compositus.
Syrupus Scillæ.*
Colchici.*
Trochisci Glycyrrhizæ et Opii.*
Carbonatis Calcis.*
Vinum Gentianæ Comp.
Rhei.*
Antimonii.

The following list differs from the London and Edinburgh formulæ, and coincides with those of the Dublin College. Those marked with a dagger are not ordered by the other British Colleges.

Acidum Sulphuricum Aromaticum.
Confectio Scammonii.
Emplastrum Calefaciens.†
Tinctura Angusturæ.
Quassiæ.
Moschi.†
Infusum Valerianæ.†
Pulvis Aloes et Canellæ.
Unguentum Carb. Plumbi.
Simplex.
Vinum Ipecacuanhæ.

The following preparations differ from those of the British Colleges.

The *acetum colchici* and *acetum scillæ* are of the same strength with those of the London College, containing half a fluid ounce of alcohol to the pint, in place of a fluid ounce of proof spirit. The *alcohol ammoniatum aromaticum* contains the oils of cloves and cinnamon, in addition to those of rosemary and lemon, ordered by the Edinburgh College.

The remaining *aquæ medicatæ* are prepared by triturating the essential oils with magnesia, a simple and elegant mode of

preparation. The *cerate of cantharides* supplies the place of the cantharides plaster of the British Colleges, and contains one third; the London plaster contains two-sevenths; the Dublin three-tenths; and the Edinburgh one fourth of flies. Our own is therefore the most certain preparation. The *ceratum sabinæ* is prepared by mixing two ounces of powdered savin with a pound of resin cerate. The difficulty of procuring recent savin probably induced the convention to direct this formula, as powdered leaves of an excellent quality are imported from London. Dr Duncan says, the ointment, when thus made, is intolerably acrid and almost caustic, and that its use should be discontinued. Our own experience has been different, and we have found it a safe and efficacious irritant. The *ceratum simplex* differs from any of the simple cerates of the British Colleges, but is well suited to our climate. The *confectio opii* is of the same strength as that of London and Dublin, merely differing in substituting the *pulvis aromaticus* of Edinburgh. The *infusum digitalis* differs from that of Edinburgh in substituting *tincture* for *spirit* of cinnamon. The strength of this preparation in all the Pharmacopœias is alike.

The *infusum sennæ* is of the same strength with that of the Dublin College, substituting coriander for ginger. The *linimentum ammoniæ* contains a fifth, that of London a third, and those of Edinburgh and Dublin a ninth part of water of ammonia. The *linimentum saponis* agrees with the London and Dublin Colleges; except that a fluid drachm each of oils of rosemary and origanum, and a pint of alcohol are substituted for a pint of spirit of rosemary, and animal soap in place of soap of olive oil. The *mistura cretæ* is double the strength of that of the British Colleges.

The *syrupus allii* is made in the same manner as the syrup of squills, and will, we think, be generally regarded as an improvement. The *syrupus zingiberis* is made from the tincture, which is four times the strength of the English preparation, and answers extremely well for this purpose. When made in

the common manner by boiling the root in water, the syrup becomes loaded with the fecula of the ginger and is very apt to spoil.

The *tinctura aloes* contains the same proportions of aloes as the Edinburgh, and half that of the London and Dublin Colleges. Its alcohol is stronger than that of the British. The *tinctura cinchonæ* contains six ounces, that of Edinburgh and Dublin four, and that of London seven ounces to the quart of alcohol. The *tinctura cinchonæ composita* merely substitutes red saunders for cochineal.

The *tinctura opii camphorata* is that of the Dublin College, adding half an ounce of liquorice and two ounces of honey.

The *tinctura sennæ et jalapæ* is the *tinctura sennæ comp.* of Edinburgh, adding half an ounce of caraway and two drachms of cardamom seeds.

The *unguentum gallæ* contains an eighth, that of Edinburgh a ninth part of galls. The *unguentum hydrargyri ammoniati* contains a ninth, that of the British Colleges a thirteenth part of white precipitate.

The *unguentum hydrargyri nitratis* is made with the same proportions of mercury and acid as are used by the London College; and the same proportions of fatty matter as the Edinburgh, substituting neatsfoot oil for olive oil. The proper preparation of this ointment is still a problem. Dr Duncan says the best he has ever seen was made with 12 oz. nitrous acid, 4 oz. mercury, 26½ oz. olive oil, and 15 oz. lard, mixed *while hot* in a large mortar, and assisting the operation by heat if it should not froth up.

The *vinum aloes* is that of Edinburgh, made of double the strength, to correspond with the proportions of aloes used by the other Colleges. The *vinum colchici* being made with the dry bulb, cannot be compared with the London formula, in which the fresh bulb is used. It is however a powerful remedy. The *vinum tabaci* is made with a pint, that of Edinburgh with twelve ounces of wine to the ounce. The *vinum veratri* is of the same strength with the London preparation.

In performing this analysis I have not thought it worth while to notice any of the chemicals, as the mode of preparing them does not affect the identity of the medicine, nor have I included the preparations peculiar to our Pharmacopœia.

The physician and apothecary having most reliance on the authority of the London College, will be compelled, I should think, to confess that the change from its formulæ to those of the Pharmacopœia of the United States, will not be a violent change by any means; and that the convenience of having a common standard throughout our widely extended country, far outweighs the little difficulties which custom and prejudice may fancy to result from the adoption of the National Pharmacopœia.

REVIEW.

ARTICLE VI.—*The Edinburgh New Dispensatory, &c. By Andrew Duncan, M.D. Twelfth edition. Edinburgh,* 1830, *pp.* 1127.

[Continued from Vol. III. p. 261.]

By comparing the present, with some of the earlier editions of this work, the student will become sensible of the great improvements which have been made in pharmaceutical science within the last twenty years. And he will also find that it is from the continent, where pharmacy is sedulously taught and studied, where an entrance into the profession is only to be gained by years of scientific as well as manual application, that almost all these improvements have emanated. It is surprising with what patience, minuteness and accuracy these German and French pharmaciens pursue their researches. From the most subtle and refined chemical analysis, down to the determination of the loss which leaves and roots sustain in drying and powdering—nothing escapes them. They have determined the quantity of essential and fixed oils, of alcoholic and watery extract, furnished by a large number of the officinal plants, and there is not on record a more beautiful example of patient and skilful investigation, than their researches into the properties of the bitter almond and the white mustard seed. The most striking proof of the eminence which the profession has attained is to be found in the Journal de Pharmacie. That

invaluable journal is a record of the progress of modern chemistry; and so completely are the two sciences of Chemistry and Pharmacy blended in its pages, that, if we were to abstract from the history of the former, the discoveries made by practical pharmaciens, we should at once blot out some of the noblest triumphs of modern science, and reduce the all controlling chemistry of the present day, which is rendering magnetism and electricity and light its tributaries—we should reduce this most wonderful of sciences—almost to the narrow limits which it occupied in the days of Black and Lavoisier.

It is his acquaintance with the labours of these patient investigators, that has enabled Dr Duncan to present his Dispensatory to the English public, in its present greatly improved form. He is himself, principally, a judicious and careful compiler, and has not contributed much from his own researches to enrich the science to which he has devoted himself. We were particularly struck with the passage in which he informs us that he thought he had discovered cinchonine in the columbo. Would Pelletier or Robiquet have taken so much pains to announce that they had done something which amounted to nothing?

We are sorry to perceive that the work has been printed with extreme carelessness. As examples of this, we may refer to page 654, where sulphate is printed for sulphuret; to p. 664, nitrous acid for nitric acid; p. 667, 120 parts for 124 parts of water; p. 741, muriatic acid for caustic ammonia; p. 799, protoacetate for protonitrate; p. 811, peroxide for protoxide. The references in the index are also inaccurately printed.

The work of Dr Duncan is entitled to the particular notice and respect of American pharmaceutists, from the circumstance of its having been extensively circulated in our country, under the title of Dr Coxe's American Dispensatory. The learned editor, it is true, incorporated into the work many passages relating to our indigenous plants, but not more than are to be found in the edition of Dr Dyckman published in New York in 1818 under its proper title. The additions of the New

York editor display in fact far more care and labour than those of Dr Coxe. The botanical references and descriptions of the American plants which it contains are prepared after the model afforded by Dr Duncan, and are extended to nearly one hundred species.

The History of the American Dispensatory deserves to be recorded as exhibiting the early stage in the progress of pharmaceutic science in America. The first edition was published in 1806, and was almost literally a reprint of the second edition of Dr Duncan's Dispensatory. The changes were, in substituting a purely alphabetical arrangement, in omitting the treatise on chemistry, and incorporating the principal part of its matter under particular heads, and in introducing, from Dr Barton's collections, short accounts of about sixty indigenous plants.

There was nothing excepting the last mentioned circumstance, and the fact that the work was printed in Philadelphia, to entitle it to the name of an American Dispensatory. Nearly every article was left as it came from the hands of Dr Duncan, and having a particular reference to the localities of Great Britain. We were told, for example, that *bryony* was an indigenous plant; that *calamus* grows plentifully about Norwich; that the *aconite*, the *anchusa*, the *hellebore*, &c. are commonly cultivated in our gardens; that the *Rhamnus catharticus* is common in hedges; and that *tobacco* is sometimes cultivated for medicinal use in gardens, but that in general it is imported from America. Dr Duncan, as may be supposed, was much offended by this claim of authorship, and in the fourth edition of his work, speaks of Dr Coxe's book as a *reprint* of his second edition.

"With due respect to my friend Dr Duncan," says the American editor, in the advertisement to his second edition, "I must, in justice to myself, regard it as a new work, inasmuch as the arrangement differs totally from every other work of the kind hitherto published. The materials of a work of this nature must necessarily be the same in a greater or less degree

in all; and the doctor owes the celebrity of his own editions to the free use he has made of the works of others." This is to be sure a home thrust; for the first edition of Dr Duncan's Dispensatory was almost as completely Dr Lewis's, so far as regards the body of the work, as Coxe's was Duncan's. The new chemical language was indeed introduced, and this was, at that time of day, a task of delicacy and importance; rather more so, we think, than that of the mere transposition of parts. Setting aside, therefore, the relative claims of Dr Coxe to authorship, we think his positive claims to the honour almost as doubtful as those which are made at the patent office by the inventors of new churns and washing machines, and which are so pleasantly discussed and settled by the facetious editor of the Franklin Journal. That "the materials of a work of this kind must necessarily be the same in a greater or less degree in all" is indeed true. But then every author who brings forth a new compilation, is presumed to have some definite object in view, differing from those aimed at by his predecessors. He wishes to blend with former labours, some additional branch of knowledge, or he writes, as in the case of Dr Coxe, for a new locality. In either case his point of view is changed. Objects important and close at hand, in the one case, are lost in the distance, in the other, and new objects, unknown, unnoticed, or unimportant in the former, become essential to his plan in the latter. He cannot, it is true, alter facts. But there is a process of mental digestion and assimilation as essential to the proper execution of a compiled, as of an original performance. That work, be the station and the learning of its god-father what they may, does not entitle him to the name of author, which is made up with little other help than the scissars or an index.

The second edition of the American Dispensatory was published in 1810, and contained many valuable additions from the fourth Edinburgh edition. Its value was enhanced by a list of synonymes copied entirely from the Dictionary of Merchandise, published in this city in 1805. The third

edition was printed with few alterations. In the interval between that and the fourth edition, appeared Dr Thatcher's Dispensatory, a work having higher claims to originality than any American Dispensatory hitherto published. Dr Coxe did not hesitate to avail himself of Dr Thatcher's descriptions of indigenous plants, which he substituted for the short and imperfect notices of Barton. These extracts from Thatcher have contributed more to the value of the work than all the other additions which the editor has made. They gave it in some degree what it did not before possess, an American character. Being incorporated with the valuable matter of the Edinburgh Dispensatory, the whole work was of a more useful and practical character than that of Thatcher's, who thus furnished his rival with the means of superseding him in public estimation. Even-handed justice, we think, would have ordered it otherwise, and secured to Dr Thatcher, the reputation and the profit to which he was fairly entitled by this portion of his Dispensatory.

The subsequent editions of Dr Coxe's work were enlarged with copious extracts from Paris's Pharmacologia, and from that farrago of *unauthenticated matter*—Gray's Supplement to the Pharmacopœia. Upon a few articles, such as cinchona, jalap, opium, cyanogen, and some others, he has abandoned his original text, and borrowed copiously from other sources, or added new matter of his own. The main body of his Dispensatory, however, retains its original form. It has not even been deemed necessary to accommodate the text to the changes which have been made by the British colleges. For example, preparations are given in the ninth and last edition as officinal, which have long been rejected by the colleges. The glass, and the cerated glass of antimony, are both inserted as officinal preparations of the Edinburgh Pharmacopœia, although no longer to be found there. The absurd direction for making the cerated glass is also retained, although, if the author had consulted the French Pharmacopœias, he would have discovered its incorrectness.

This edition has also been prepared without making any use of the twelfth edition of Dr Duncan, which was printed in 1830, or of the latest revision of the Dublin Pharmacopœia, which is now the most accurate and scientific of the British authorities.

The most singular feature of the ninth edition of the American Dispensatory—the object we suspect for which it was hurried before the public, is, the annotations upon the Pharmacopœia of 1830; or as he styles the rival revisions, the New York and Philadelphia Pharmacopœias. The appearance of these works has reconciled our author to the Pharmacopœia of 1820, in the condemnation of which he was formerly loud; but which he now appears willing to regard as an authoritative standard. He condemns, of course, both revisions—"yet likes the worst the best." We have carefully examined these notes, and are compelled to pronounce the censures which he bestows upon the revision of the Washington convention, to be trivial and puerile. He does not detect a single incorrect statement or false formula in it; while he points out several of those in the New York edition. He lavishes notes of admiration upon changes trifling in themselves, yet growing out of the adoption of a more symmetrical arrangement and correct nomenclature; and in many instances where he censures the convention for deviating from the British colleges, it has in fact followed them. We shall take a future occasion to examine the unfairness of these criticisms at greater length than is now in our power. In the mean time, we may enter our caveat against the rebuke of the learned professor, for the severity of criticism bestowed upon the New York Pharmacopœia. Our sentence, we believe, has been confirmed by the public. We are not conscious of having set down any thing in malice. Just criticism is forced at times to be severe and harsh, as we may seem to have been upon that and upon the present occasion; yet we have in both instances restrained and not given way to our feelings. The private worth, the learning and high respectability of Dr Coxe are univer-

sally acknowledged; but representing, as we do, the interests of the pharmaceutic profession, we have felt ourselves bound to seize the first occasion that has presented itself, of examining the claims of the American Dispensatory to the character of an original work. Those claims we honestly think cannot be sustained at the bar of just criticism. The improved state of pharmacy in this country, the zeal with which it is studied, the talent which is becoming embarked in its pursuits, imperiously demand a work of a higher order. The time, we trust, is not distant when that call will be answered.

SELECTED ARTICLES.

ARTICLE VII.—*On the Action of Sulphurous Acid on Hydriodic Acid, either in a free or combined state. By M. Saladin.*

IN most treatises on chemistry, it is asserted that sulphurous acid exerted no action on hydriodic acid and the hydriodates. Whilst endeavouring, a short time since, to ascertain the cause of the marked yellow colour which is communicated by the sulphuric ether of commerce to a solution of hydriodate of lime, I was led to some results, which appear to me to controvert this assertion.

If a few drops of hydriodic acid, or of a solution of any of the hydriodates, be poured on some liquid sulphurous acid, entirely free from nitrous or sulphuric acids, and made by the combustion of purified sulphur, a yellow colour is instantly developed, the intensity of which is in proportion to the degree of the concentration of the acids; the action of the air, of heat, or of an alkali, causes its rapid disappearance.

I at first attributed this to the presence of iodic acid, or an iodate in the compounds made use of, but having in vain endeavoured to detect them by the nitrates of silver, barytes and lead, hydro-sulphuric acid, pure alcohol, prolonged calcination, &c. and hydriodic acids, prepared from the protoioduret of phosphorus, having presented the same phenomena, it was no longer to be doubted that they were acted on by sulphurous acid.

If rectified sulphuric ether be agitated with the fluid thus coloured, it also acquires, in a short time, a similar tint, though less intense; it is, however, much darker when an ether charged with sulphurous acid is added to a hydriodate.

If the mixture of sulphurous acid, and the acid or alkaline solution, be exposed to the air, the upper stratum rapidly loses its colour, and this change is gradually extended to the whole of the fluid. This phenomenon is owing as well to the volatilization of a part of the iodine (shown by the tinging of the paper used to cover the test glass), as to the transformation of the other into hydriodic acid, arising from the reaction of the sulphurous acid on this simple body.

On adding an additional quantity of sulphurous acid, the fluid regains the yellow colour it had lost, though this tint is lighter on each repetition of the process, and at last it becomes turbid, deposits sulphur, and all the hydriodate it contains is gradually replaced by an acid sulphate. It is unnecessary to add, that the action of the acid is sensible in proportion to its strength, that the quantity of iodine, even where the acid is powerful, is very small, and always requires twice its volume of acid gas.

The mixture of a hydriodate with sulphurous acid, subjected to distillation, at first rapidly loses its colour; as the excess of this latter passes off, a small quantity of hydriodic acid is then disengaged; the fluid in the retort becomes more and more coloured, and contains a portion of the salt employed, mixed with iodine, a sulphate and sulphur.

It may not be superfluous to remark, that among the reagents capable of showing the presence of the simple or the ioduretted hydriodic acid, the nitrate of silver is to be preferred, from the complete insolubility of its ioduret, to the subacetate of lead, or the salts of the protoxide or deutoxide of mercury. The solubility of the ioduret of lead is well ascertained, and the proto and deuto-iodurets of mercury, partaking of this property, do not deserve the epithet of insoluble. I will not speak of the first, which is only soluble in 2375 parts of water; but the latter

being much more soluble, appears to merit some attention: it in fact dissolves, when pure and freed from an excess of hydriodate or mercurial salts, not only in ether and alcohol, but also in water, the medium of its solubility appears to me to be, in ether $\frac{13}{1000}$ or $0.01\frac{1}{9}$; in rectified alcohol $\frac{27}{1000}$ or $00.2\frac{5}{8}$; in distilled water $\frac{39}{1000}$ or $00.3\frac{9}{10}$. When permitted to evaporate slowly and spontaneously, its aqueous solution deposits some reddish points, mixed with microscopic crystals.—*Journal de Chimie Medicale, Sept.* 1831.

ARTICLE VIII.—*Notes on Narcotine. By M. Robiquet.*

Narcotine has been the subject of much controversy, for, after having been considered by Derosnes as a principle *sui generis*, Sertuerner viewed it as merely a salt of morphine; some physiologists have regarded it as so powerful a narcotic, that they have thought it worthy of forming the type of this class of remedies; others, on the contrary, are of opinion that it is wholly inert. MM. Dumas and Pelletier have found that it contains 7.21 per cent of nitrogen; Liebig has recently stated that it only contained 2.51. To all these contradictory views I am about to add some others, which contribute not a little to embarrass the subject, and to demonstrate, that, as regards organic substances, we must consider them often, before we attempt to decide on their nature.

Hitherto narcotine has been regarded as wholly incapable of saturating the acids, although, from the first, its faculty of dissolving in them was admitted; but a particular circumstance having induced me to examine this more closely, I am now of opinion, that it is capable of saturating these bodies, and of combining with them as fully as a majority of the organic alkalies.

For a long time past, I have been occupied with the preparation of morphine, and I have paid great attention to the choice of the best qualities of opium, and have not had recourse to any other plan than that of macerations in cold water without the addition of any acid; nevertheless it was pointed out to me, a short time since, that my morphine contained a notable proportion of narcotine, which I was far from suspecting, after the precautions I had taken. I supposed, at first, that the presence of the narcotine was owing to the treatment of the opium having been divided, and that the last portions would contain all the narcotine which should have been diffused through the entire product. I therefore ordered that no morphine should be delivered until the whole treatment was finished, and the different products well mixed together. This time 100 lbs. of opium had been operated on, and nevertheless the narcotine was still found in the same relative proportion; thus proving that the narcotine which I supposed to remain in the greatest quantity in the marc, was almost wholly taken up in the cold aqueous macerations. Having also found that the best qualities of opium were not always the richest in morphine, I decided on never purchasing any of that drug without subjecting it to a trial.

The great solubility of narcotine in the aqueous menstruum, being only reasonably attributable to the superabundant acid of the opium, I was naturally led to again investigate the degree of this solubility, and was not a little surprised to find that narcotine, precipitated from these infusions by means of ammonia, and purified with alcohol, so completely saturated the sulphuric and muriatic acids, as to destroy their acid taste, though not their property of acting on test papers. Moreover, the combinations which resulted, were capable of crystallizing like true salts, and remained unalterable when exposed to the action of the air. This result is particularly remarkable in the hydrochlorate.

I endeavoured to determine the proportions of these combinations, and for this purpose exactly weighed out one gramme of concentrated sulphuric acid; diluted it with a certain quan-

tity of water, subjected it to a slight heat, and added very pure, well dried and pulverized narcotine, until the acid was saturated. This required eight grammes, which is remarkable, as the proportion of one to eight is precisely that indicated by MM. Dumas and Pelletier for the sulphate of morphine. In fact, according to those chemists, 100 of morphine will saturate 12.465 of sulphuric acid; now the quotient of 100 by 8 is 12.50.

I was also desirous of ascertaining the proportion of hydrochloric acid necessary to saturate a determined quantity of narcotine; and to attain this with certainty, I had recourse to the method employed by M. Liebig, which consists in placing a given weight of the organic alkali in contact with dry hydrochloric gas, then driving off the excess of gas by a current of carbonic acid gas and weighing the residuum; but I found it impossible by this means to get rid of the excess of acid; I acted on ten grammes of narcotine, and the mass had absorbed hydrochloric gas, which could not be disengaged from it either by carbonic acid gas or heat. However, I remarked that the combination of the acid and the narcotine took place with disengagement of heat, as was observed by M. Liebig with organic bases.

Acetic acid acts in a very different manner on narcotine. This acid when cold and at 7° of concentration, dissolves it very well, and in so large a quantity, as to give the fluid a syrupy consistence; but if it be heated, the narcotine precipitates on the first action of the heat, and long before the acid is volatilized. This is not the case with morphine, as its combination with acetic acid is not destroyed even when evaporated to dryness, hence this is a mode to which daily recourse is had, to separate these two bodies.

By no means the same effect takes place with the sulphuric and muriatic acids; their combination with narcotine is not in the least disturbed by the heat of a water bath, or even by evaporation to dryness. These solutions, when acted on by heat, preserve their transparency and assume greater consistence, thickening like a concentrated solution of gum, and finally become

completely dry; the product is redissolved in water without leaving the slightest residue. Hence, they are very permanent combinations; but whether they are analogous to the same combinations of the common organic alkalies, the actual state of our knowledge does not permit us to decide, as from the last observations of M. Liebig, we remain in uncertainty as to the true composition of narcotine, for the differences are so great, and they are so completely beyond the limits of possible errors in chemists of such abilities as those who have treated on this subject, that I am persuaded that they could not have operated on the same body.

It is doubtless recollected, for this question is often discussed, that struck with the presence of ammonia in those vegetables which furnish organic bases, and with that of nitrogen in these same bases, that strengthened moreover by the necessity of having recourse to alkalies and often to acids to extract these organic bases, I maintained that they did not pre-exist in the vegetables, and that, founding my opinion on the capacity of saturation of morphine, I was of opinion that their alkalinity was owing to the presence of ammonia. This opinion was ably combated by MM. Pelletier and Dumas, who demonstrated that among the organic bases, it was not those which contained the most nitrogen which possessed the greatest capacity of saturation. I replied to this, that it might happen that a substance primarily azotic would combine, in consequence of the chemical reactions made use of to extract the organic bases, with a certain dose of ammonia, and that then the capacity of saturation would no longer be found in relation to the nitrogen. This opinion was not adopted, and that of MM. Pelletier and Dumas prevailed. At the present time M. Liebig puts the whole in doubt, and gives as the constant result of his new researches, "that in comparing the quantity of acid which neutralizes a certain quantity of a vegetable base, it is found that each atom of acid combines with a certain quantity of the base which contains exactly two atoms of nitrogen." This relation which exists between the acid and

the nitrogen has induced M. Liebig to say, "that it would appear that the alkaline properties of these bodies may be essentially dependent on the presence of the nitrogen they are supposed to contain, whether in the form of ammonia, or in that of some other unknown combination." M. Liebig gives more weight to this latter opinion, in dwelling on the manner in which the nitric acid acts, which destroys all these organic bases, without combining with the ammonia, which could not fail to take place, according to him, if these bases contained it in a primary state. I will not now examine how far this opinion is exempt from objections, but it so closely approaches my own, that I cannot help feeling some satisfaction in having always persisted in a belief that the organic bases do not pre-exist in the plants, and that their alkalinity is owing to an eventual combination with nitrogen. However, we approach the limits of this discussion, and the new researches which have excited the present differences of opinion, will, I hope, tend to raise the remainder of the veil which disguises the truth we are all anxious to discover.

I cannot terminate this short notice, without stating, that, struck with the excessive bitterness of the salts of narcotine, I have not been persuaded, notwithstanding the observations of M. Lebailly, that this substance has no action on the animal economy, and I have begged one of our colleagues to make some experiments on this subject, to which he has kindly consented. As soon as the results are communicated to me, I will hasten to lay them before the society.—*Journal de Pharmacie, November* 1831.

Article IX.—*On Aloes, Catechu, Kino and Opium. By M. Guibourt.*

I am indebted to the friendly and active correspondence of Mr Pereira, Professor of Materia Medica and Pharmacy in London, for a great number of new substances and observations well worthy of the attention of the Society of Pharmacy.

Aloes. Three kinds of aloes have always been recognised in France, the *socotorine*, *hepatic* and *caballine*, but these names have been applied to very different species at different times, observing, however, the first has always been applied to the best kind then in the market, that of hepatic to the next quality, and caballine to the inferior kinds. Thus, the aloes from Socotora, which ought to be the true Socotorine aloes, having disappeared from commerce, the name of Socotorine aloes was transferred to aloes from the Cape of Good Hope; that of hepatic aloes was given to the aloes from Barbadoes; and finally, we have successively seen two inferior kinds, but differing widely from each other, bear the name of caballine aloes.

To enable me to remove this confusion, Mr Pereira has been kind enough to send me specimens of the true socotorine and hepatic aloes. I will endeavour to describe them, though, to tell the truth, it is difficult to point out the shades of smell and colour which distinguish the different kinds of the same product.

1. *True Socotorine Aloes*, Pereira. Ainslie, in his Materia Medica, Vol. I. p. 9, characterises this aloes very well in saying that it is of a reddish brown, shining, as if varnished, of an aromatic agreeable odour. Duncan, in the New Edinburgh Dispensatory, describes it in nearly the same terms: surface shining and clear and somewhat pellucid; colour yellowish red with a purple reflection; odour not disagreeable, somewhat resembling that of myrrh. When cold it is hard

and friable; but it readily reunites in a single mass, and softens under the fingers like wax. If it be divided and dried in the air, it is readily pulverisable, and its powder is of a brilliant golden yellow. To these characters I may add that this aloes is of a much lighter colour than that from the Cape of Good Hope, and also that it is translucent, when in mass, when opposed to the light, whilst the African kind is only transparent in thin laminæ; the latter is of a brown black, appearing greenish in mass, red when divided into small conchoidal plates, whilst the former is reddish in mass and light coloured when it is divided. The smell also is wholly different; the socotorine, in mass, has a mild and agreeable odour; that from the cape has a strong odour which, for a long time, we have been accustomed to consider as the type of the smell of aloes.

Besides the above described aloes, Mr Pereira previously sent me a specimen which is only translucent, instead of being transparent; which loses its lustre on exposure, and is less friable.

2. *Real Hepatic Aloes.* This aloes is opake and of a liver colour; it assumes a rounded form on melting, like pitch, although it appears very hard. It is difficult to break; in smell it resembles the socotorine.

These two aloes are brought from Bombay to England, packed in buffalo skins. According to a London druggist, the socotorine may even be found forming a sort of vein in the midst of a mass of hepatic aloes: the analogous smell of these two aloes might in fact lead to the supposition that they were derived from the same plant; nevertheless the other characters of the first described socotorine and the hepatic, differ so much that I can scarcely believe that they can be the product of the same operation.

Although this aloes is brought from Bombay, it must not be supposed that it is not better entitled to the name of socotorine aloes than that from the Cape of Good Hope. Ainslie leaves us no doubt on this subject. He informs us that in India, they prepare from the *Aloe perfoliata*, only an inferior

kind of aloes, named *mozambrun*, and that those which are most used there, come from the Cape of Good Hope and the eastern parts of Africa (Cape Aloes), or from the island of Socotora (socotorine aloes), or from Yemen in Arabia (hepatic aloes). According to him, this last is probably obtained from the *Aloe perfoliata*, whilst the socotorine, and even the Cape aloes, is procured from the *Aloe spicata*. If reference was had only to the smell of these products, I should rather attribute the hepatic and socotorine to one plant and the Cape aloes to another.

I will not here revert to the description of the Cape and Barbadoes aloes, as they are well known; as to the *caballine*, I have two very different kinds, of the origin of which I am not certain, therefore this is not the time to speak of it.

Catechu. All authors on materia medica, as Ainslie, Duncan, Fee, myself, and even Thenard in his Treatise on Chemistry, have cited the analysis of Davy of two kinds of catechu, which he terms Bengal catechu, and Bombay catechu; but as I remarked that Thenard has attributed a lighter colour to the latter, whilst Duncan and Ainslie assert the contrary, to clear up my doubts on the subject, I sent to Mr Pereira all the kinds of catechu that I possessed, begging him to inform me which of them was called Bengal or Bombay catechu in England: his reply was as follows:

"I am obliged to state to you that these terms are wholly unknown to our druggists and Indian traders. No catechu is brought here from Bombay, and consequently there is in reality no such article as Bombay catechu; whilst the term Bengal is applicable to every kind, as all that we receive comes by way of Bengal. It is curious that there are no terms in commerce to distinguish the different species of catechu; this subject is still involved in much obscurity. After having attentively read Davy's memoir, I am of opinion that the name Bombay catechu employed by him, refers to a blackish kind of catechu."

In transmitting to Mr Pereira my different kinds of catechu,

I also wished to procure the best sorts, which have been entirely wanting in Paris for many years past. Unfortunately it appears that they are also very rare in England, so that they are obliged to use the common catechu of commerce, which contains 25 per cent of sand, and is perhaps the worst that ever existed. Mr Pereira, on his part, wished to ascertain whether a catechu in small cubic pieces, which I described as adulterated with starch, was the same as a cubical, dull, light catechu, much esteemed in England; by the reciprocal interchange of specimens, we convinced ourselves that these two catechus were entirely different. The final result of these exchanges was, that I now recognize nine kinds of catechu, viz.

1. *Dull and reddish Catechu in balls.* In rounded pieces of three or four ounces in weight, having a marbled and undulated fracture, and presenting on the lower surface a great number of specks, which appeared to me to be rice chaff. See *Histoire Abrégée des Drogues Simples, No.* 761. I have always considered this as the best, at least it is one of the best. It is now wanting in commerce, and is the kind designated by Antoine Jussieu as catechu in balls. See *Memoires de l'Academie*, 1720, or *Le Dictionnaire des Drogues de Lemery*, p. 208.

2. *Flat and orbicular brown Catechu.* Very hard, heavy, of a dark brown, fracture shining. It has also disappeared from commerce. (*Hist. des Drogues, No.* 762. *Cachou en masses aplaties. Lemery*, p. 208.)

3. *Pure Catechu in mass.* (*Hist. des Drog. No.* 763.) Of a uniform dark yellowish brown, smooth conchoidal fracture, wrapped in large leaves, very much reticulated. This catechu appeared in commerce about fifteen years since, and was bought up for the central pharmacy of the hospitals; I have not since met with it. It is evidently of a superior quality.

4. *Cubic dull Catechu.* In pieces of two inches square, and one inch in thickness; it is very clean externally, and not studded with rice chaff. Internally, the best pieces are analogous to No. 1, but in general, they are duller and more grey,

and formed of parallel layers like slate, readily separating into two or three fragments in the direction of the layers. They then form flat pieces, blackish on one side and greyish on the other, somewhat resembling the bark of a tree. This is what is meant by A. de Jussieu, where he says, that catechu was sometimes in the shape of the bark of a tree. This catechu contains starch, which remains insoluble, combined to a portion of tannin, when it is heated by cold water. Some years ago I saw a large quantity of it in the possession of a druggist in Paris.

5. *Whitish Catechu.* This catechu was sent from India to Mr Pereira, under the name of *katha suffaid*, and Dr Wallich informed him that *saffaed* or *suffaed* meant white or pale. This catechu is black on the exterior, hard and heavy, so that it might be taken at first sight for a blackish stone, but internally it is almost white, and without lustre. It appears to have been in the form of small loaves, or flat and rounded lozenges, of about an inch in diameter; but very often this form is altered during the desiccation, in a greater or less degree. This catechu has a very bitter, astringent taste, somewhat saccharine, and leaving a taste of smoke in the mouth. This latter circumstance leads me to think that its external black colour is owing to its having been dried by smoke.

6. *Amylaceous Catechu in small cubes*, described in the *Hist. des Drogues, No.* 764. Previously examined by M. Planche, Journ. de Pharm. I. page 212. Both M. Planche and myself thought that this catechu was a fraudulent product, manufactured in Europe; but it is possible that it may come from India, where, on the authority of Gracias, it is said that it is customary to add some kind of flour to the catechu, to facilitate the fabrication of it.

7. *Cubic resinous Catechu.* From the want of a more appropriate name, I thus designate a species of catechu, which was sent to me by Mr Pereira, to ascertain whether it was the same kind as that which I had described as *adulterated catechu*, expressing his astonishment that I should speak thus of an ar-

ticle so highly esteemed in England; these two catechus, however, are very different.

This is in pieces about an inch square. It is very light, as if porous, of a dull and uniform orange red internally, and of a darker shade on the exterior. It wholly dissolves in the mouth, is very astringent; but does not leave a sweet taste. It is almost entirely soluble in cold water, and the residuum contains, instead of starch, a resin fusible in boiling water, and soluble in alcohol, hence I have given it the name of resinous catechu.

8. *Silicious brown Catechu.* I cannot otherwise designate the common catechu of commerce, which appears to me to be a fraudulent product, intended to imitate and replace No. 2. This catechu is in square, rounded, globular, or flattened pieces, of a considerable size, often weighing near a pound; it is a uniform dark brown colour, has a compact, somewhat shining fracture, and in a strong light presents many brilliant points, from the admixture of silicious particles. It is very hard and heavy, and gives a residuum of 26 per cent of earthy matters on calcination. This kind of catechu more particularly is known in London by the name of *tena japonica.*

9. *Black and mucilaginous Catechu.* This is in pieces of 18 lines square, by an inch in thickness. Externally, it is similar to No. 4; but internally, it is quite black and shining; it has a mucilaginous taste, and is feebly astringent.

At first sight it may appear strange that so many kinds of catechu should exist, but it is readily explainable, when we take into consideration the great number of countries that furnish it, the different modes in which it may be prepared, and the national habit which induces the people of every country to give a special form to the products of their industry which distinguish them from those of other nations. Hence, notwithstanding the assurance given to Mr Pereira by the East Indian traders, we cannot avoid believing that there exists a species of catechu brought from Bombay or Goa, and which is different from that derived from Bengal: for Gracias states

that the tree named caté (*acacia catechu*) is especially found in the peninsula of Cambay, at Goa, and in the surrounding country; and Ainslie says, that two kinds of catechu are exported from India to Europe, the one pale, coming from the province of Canara by way of Bengal, the other of a yellowish brown, coming from Behar, by way of Bombay; moreover, according to the account of Colonel Kirkpatrick, a third sort is derived from Nepaul; finally, Ainslie states, that in the Bazars of Maritime India, two other substances, resembling catechu, are to be met with, which are used by the European and native physicians. These two substances are the *cutta camboo* and the *cashcuttie*, prepared in the kingdoms of Pegu and Assam, and in the Mysore, from the seeds of the *Areca catechu*.

It is therefore certain, that several kinds of catechu exist; but to particularise, among those which we possess, those which come from Nepaul, Bengal, Pegu, Bombay, &c. and which are the product of the *Acacia catechu* or of the *Areca*, is at present impossible.

Kino. Several kinds of kino are found in commerce, and authors mention several trees of very different families and from various countries, which are said to produce this article; but until travellers bring us juices or extracts obtained from these trees, identical with those of commerce, we shall be obliged to remain in uncertainty on the origin of these latter, and in many cases to substitute new opinions for those we formerly promulgated, and perhaps be also forced to abandon these.

I described, in the *Histoire des Drogues Simples*, two principal kinds of kino; one (No. 766) in irregular masses, broken into fragments of one to three drachms in weight; some pieces presented rectangular impressions resembling those which might be produced by straw matting. I have said that it was completely opake, which is generally the case; but I have since met with it of a superior quality, with a vitreous frac-

ture, and transparent when in laminæ, especially when examined with a microscope. This is the same kino as that described by Murray (Apparatus vi. p. 203), and regarded by him as the *astringent gutta Gambia* of Fothergill, which appears to be produced by the *Pterocarpus erinaceus, Lam.* It is also the third variety of Duncan, attributed by him to the *Eucalyptus resinifera* of New Holland; I myself was of opinion, on the authority of M. Virey, that it is derived from the *Nauclea Gambeer* of the Sunda islands (*Uncaria Gambeer, Rox.*). Mr Pereira now tells me that one of his friends, who was a physician in Jamaica, found that this kino was prepared in that island from the *Coccoloba uvifera.*

The second kind of kino (No. 767) is in very small fragments, of a brilliant black colour, transparent, and of a ruby red when they are reduced into thin laminæ. Every fragment of any size presents on one of its faces parallel grooves, which I attribute to the form of the vase in which it was dried in thin layers. This kino would be the second variety of Duncan, if this learned pharmacologist had not attributed to the latter a considerably bitter and astringent taste, whilst that of mine is purely astringent. Be this as it may, on his authority I have attributed this substance to the *Coccoloba uvifera* of America, remarking, however, that the grains of pepper which I have found in it, might induce a belief that it came from Asia. Dr Duncan himself states that the kino which is imported into England by the East India company, resembles this kind in many particulars. Mr Pereira now tells me, that in fact this kino is brought by the East India Company; that it is very common in England, where it bears the name of *Amboyna* or *East Indian Kino;* and finally, that it is generally supposed that it is extracted from the leaves of the *Uncaria gambeer.*

I have spoken in the *Histoire des Drogues, No.* 768, of some other kinds of kino which I regarded as varieties or alterations of the two preceding. This is true, as regards the kind B, which presents the grooves of the last mentioned species, and evidently belongs to the same manufacture; but I think

that the kind A, which is recognisable by its dull brown colour, approaching to that of the liver, and its complete opacity, is different from No. 766. This *dull brown* kino, moreover, appears to have been divided into masses of about 15 to 18 lines square, all the faces of which are smooth and destitute of any marks; it therefore belongs to another manufacture, and probably comes from another country, for, as regards foreign drugs, a difference of form almost always indicates one in the country which produces them.

I have also spoken of a kino C, which I believe was a fraudulent product, because, through the astringent, acid, and bitter taste, I thought I could always distinguish that of liquorice; but it is also possible that this article may be natural. This kino, moreover, is distinguished from the others by its powder, which is of a dark brown red, with a *violaceous* tint.

Under No. 769, I described the juice of the *Eucalyptus resinifera*, as it was brought from New Holland by M. Lesson. The characters I assigned to it agreed very well with those of the juice of the *Eucalyptus;* but it should be noticed, that they referred to the pure article, and that a sophisticated product may exist, even among those just described, which equally belongs to this Australian tree.

New kind of Kino. This variety is new to me, but it is possible that it may be the oldest of all; in short, that it may be the true *astringent gutta Gambia.* It was sent to me by Mr Pereira with the following observations:

"I have received a specimen, of which I send you a portion; it was obtained from a wholesale druggist, in whose possession it had been for ten years; it is evidently in *tears.* I would say that it came from Africa; it was imported in large packages."

This substance is in small fragments, in the form of drops or elongated tears, which have exuded through the bark of a tree and dried there. In mass it appears black, but is transparent, and of a deep ruby red when it is held between the eye and the light. Almost all the fragments present on one of their sides fragments of the grey bark from which they have

been detached. On the side which had been exposed to the air, they are wrinkled, and as if grooved, to such a degree, that I have asked myself if it was not this natural form which it had been attempted to imitate in the fabrication of the East Indian kino.

This substance has a very astringent taste; placed in cold water, it swells, and slowly and feebly tinges the fluid of a red colour. If it be examined in this swelled state, it will be seen that it is very unequally coloured, even in the same fragment; several pieces, either naturally pale, or deprived of their colour by the water, have the appearance of an insoluble, tenacious and elastic gum. As to the others, they appear to be a combination of the same gum with the red colouring principle, which has become insoluble from its oxygenation by the air; at least, it may be remarked that the outer portion of the fragments of the gum resists the action of the water much more than the interior, and remains in the form of tenacious membranes. Boiling water dissolves much more, and forms a deep red fluid which becomes very turbid on cooling; but a large proportion of the membranous substance always resists its action. It results from the above, that this kino is produced by the unequal mixture of a gummy juice and one of a red astringent character, which simultaneously flow from the same plant.

As to the question, whether this astringent gum is the same as that formerly described by Fothergill, it is extremely difficult to decide, on account of the confusion which exists in the letter in which this practitioner has described the *gutta Gambia*. It is as follows: "The new astringent gum discovered in Africa is thick and fragile, of a red colour approaching to black, and, moreover, is very opake. If, however, it be broken into small fragments, it appears of a transparent red colour. It has no smell; as soon as it is put in the mouth, it is found to be very astringent, though agreeable, and the greater portion rapidly dissolves. When it is placed in water, six-sevenths rapidly dissolve and colour it of a deep red. This gum differs from that of Senegal in being much more frangible; from dra-

gon's blood in being soluble in water, and from both, by its remarkable astringency; except for these differences, it might be mistaken for dragon's blood."

At the end of this description, Fothergill transcribes, as referring to the same substance, the following extract from the instructions given to Moore then an agent at Bruscow on the river Gambia. "There is a red liquid which flows abundantly from a tree named *pau de sangue*, and which thickens into a gum, which is very valuable; you will use every exertion to procure some of it." In reply to these instructions, Moore sent from Bruscow a gum which was supposed to be the true gum tragacanth. He took great pains to gather it; but, from 10 or 12 lbs., only two of true gum tragacanth were obtained, the remainder was only gum Senegal, of an inferior quality.

Such is Fothergill's letter; the description with which it commences is precise, and is applicable only to the substance under consideration; but we afterwards find that this gum was attributed to a tree named *pau de sangue.* Moore, who was requested to send it, transmitted as its product, a gum which was taken for the true gum tragacanth. Thus, three hypotheses present themselves; either the substance described by Fothergill was erroneously attributed to the *pau de sangue;* or Moore was deceived by the persons charged to collect the gum of that tree; or finally, the gum of Fothergill was a juice artificially extracted and dried, and that of Moore, a gum naturally exuding from the same tree, which is very possible. Hence the substance sent by Mr Pereira, which is a mixture of an astringent red juice and an insoluble gum, analogous to gum tragacanth, might also be furnished by the same plant, but this is merely conjecture.

Opium. Three kinds of opium are found in commerce at Paris, which are termed Smyrna, Constantinople and Egyptian. Being desirous of possessing East Indian opium, I re-

quested Mr Pereira to send me some, which he was kind enough to do.

1. *Smyrna Opium.* In larger or smaller masses, often deformed and flattened, from its original softness, covered on its surface with seeds analogous to those of *Rumex*, blackening and drying on exposure to the air, of a strong virous smell. This opium is justly held in high estimation; but it should be observed, that it is liable to be adulterated with a kind of opium, in *hard balls* or rounded pieces, of an inferior quality.

2. *Constantinople Opium.* Opium in small, flat, tolerably regular pieces, of a lenticular form, from two inches to two inches and a half in diameter, always covered with a poppy leaf, whose middle nervure generally marks the middle of the piece. Smell similar to the preceding, but not so strong; it blackens and dries on exposure to the air. Some persons say, that this opium is nothing more than Smyrna opium which has been remanufactured at Constantinople, and often mixed with gum which lowers its quality.

3. *Egyptian Opium.* In round, flat pieces, larger than the preceding, of a tolerably regular form, clean surface, and appearing to have been covered by a leaf of which nothing but the vestiges remain. This opium is distinguished from the preceding by its reddish colour analogous to that of hepatic aloes, by a weaker odour, and from softening in the air, instead of drying; it has also a shining surface and is somewhat adhesive to the fingers.

I have endeavoured to ascertain the relative value of these opiums, with the following results. Four ounces of each, well selected, were treated with three pounds of very hot water, at two operations. I obtained from each two ounces three drachms and a half, of a solid, friable extract. This extract was redissolved in cold water, filtered and precipitated by ammonia. I obtained, of impure morphine, from the

Smyrna opium,	7 drachms 40 grains,
Egyptian opium,	4 drachms 40 grains,
Constantinople opium,	3 drachms 55 grains.

Although these precipitates are far from being pure morphine, it nevertheless appears to me, that they may be considered as an approximative calculation of the comparative richness of the different kinds in morphine. Moreover, I again experimented on fresh quantities, redissolved the three extracts in cold water, as in the first case; but instead of immediately precipitating by ammonia, I almost saturated the solutions with common salt, which precipitated a glutinous colouring matter. The filtered fluids, precipitated by ammonia, furnished a less impure morphine than the preceding:

Smyrna opium,	7 drachms 18 grains,
Egyptian opium,	5 drachms 20 grains,
Constantinople opium,	3 drachms 55 grains.

4. *East Indian Opium.* On account of the ties which unite England with the East Indies, I imagined that the opium of the latter countries was common in London; Mr Pereira gave me the following information:

"You suppose, and very naturally, that the opium from the East Indies is imported into England; it is, however, very rare, and none has been imported here, as an object of commerce, for many years. For a long time past, I have been unable to procure any of it; but two years since, one of my pupils, now surgeon in an East Indiaman, sent me a specimen from Bombay. I transmit you a portion, regretting that I am unable to send more. One of my friends, who had been many years in India, told me that they recognise three kinds of opium there, viz. Patna, Malwa and Benares. He also stated to me, that the kind I send you is Malwa; but that of Patna is regarded as the best."

The East Indian opium, according to this specimen, appears to be formed of nearly uniform, elongated, flattened masses, not weighing more than an ounce. The exterior is clean, without any leaves or seeds; the interior is of a blackish brown, tolerably soft, having the lustre of an extract; the taste is pungent, *very bitter*, and leaving a nauseous taste; it has a smell of smoke, and is somewhat virous, but very different from that

of the Levant. This odour appears to me to indicate that it has been exposed to heat, a procedure which is, I believe, generally made use of in India.

Forty-two grains of this opium, treated with cold water, produced twenty-four grains of dry extract (two ounces two drachms and twenty grains, to four ounces of opium). The residue had neither the virous odour, nor the glutinous consistence of the Levant, which confirms my opinion that this opium must have been subjected to heat; but the extract had precisely the smell of that of common opium.

This extract redissolved in cold water, filtered and treated by ammonia, gave only three grains and a half of impure morphine, which corresponds to two drachms two scruples, to four ounces of opium. This result agrees with that of Dr Thomson, cited by Ainslie, that Turkey (Smyrna) opium, contains three times as much morphine as that from India. It is not therefore astonishing, that the latter is not imported into England.—*Journal de Pharmacie, December* 1831.

ARTICLE X.—*Theory of the Formation of Sulphuric Acid.*

The crystals which result from the action of the vapour of hypo-nitric acid and sulphurous acid are formed according to the recent experiments of M. Gaultier de Claubray:

Sulphuric acid	$\ddot{S}$ 5 atoms	64.08
Nitrous acid	$\ddot{N}$ 2 atoms	24.42
Water	$\dot{H}$ 4 atoms	11.50
		100.

In the formation of sulphuric acid, the sulphurous acid completely decomposes a portion of the hypo-nitric acid, disengages the azote, and is transformed into sulphuric acid, which

reunites to the nitrous acid and a portion of water to form the crystalline compound. When this is decomposed by an excess of water, the sulphuric acid dissolves and disengages itself from the deutoxide of azote and the hypo-nitric acid.

To analyse this crystalline compound, already examined by W. Henry, M. de Claubray pursued another plan, which, after many failures, led him to results very analogous to those indicated by theory. He first obtained a certain quantity of the crystals by passing the sulphurous gas into a vessel containing hypo-nitric acid kept at a temperature of 20°; on adding a little water and reducing the temperature to 0°, the crystals were abundantly formed; these were washed with hypo-nitric acid, and the excess of this last driven off at a temperature of from 21° to 30°, by means of a current of air perfectly dried. This combination is white, crystalline, and so rapidly attracts moisture from the air giving out rutilant fumes, that the least portion of aqueous fluid absorbed by these crystals is rendered sensible by the disengagement of red fumes; showing that they only contain a determinate quantity of water. When they are exposed to the air, they are transformed into an oleaginous liquid which contains sulphuric acid and a certain proportion of nitric and hypo-nitric acids.

The appreciation of the quantity of sulphuric acid was made in the usual way, but that of the water and nitrious acid was affected in a novel manner. Thus he got rid of the water, by mixing the crystals with pure magnesia, and passing a current of very dry oxygen over this mixture, heated to redness, taking care that the vapour should come in contact with copper at a high temperature before reaching the chloride of calcium.

As regarded the nitrous acid, he appreciated it by an equivalent, as follows:—a known weight of the crystals were placed in the bottom of a closed tube, and covered with a stratum of deutoxide of barium (ten times the weight of the crystals) free from any foreign body, a certain quantity of water was poured on it, which penetrated through the oxide and reached the crystalline compound. If the operation is properly performed,

no gas will be disengaged, the whole of the nitrous gas will combine with the barium and form a nitrate; more water must be added, and the whole boiled, to carbonate the excess of the barium, and then a sufficient quantity of sulphuric acid added, that the sulphate may represent the proportion of the nitrate. This analysis led M. Gaultier to the following:—

Sulphuric acid	65.59	5 atoms
Nitrous acid	23.96	2 atoms
Water	10.10	4 atoms.

Journ. de Pharm.

ARTICLE XI.—*Method of preparing some of the Salts of Iron. By M. Beral.*

The pharmaceutic preparations which owe their remedial properties to iron, are but rarely employed in medicine. There are, however, a number of cases in which they might be beneficially used. I have therefore thought that it might be interesting to detail the method of preparing several of the chalybeate articles.

Liquid perchloride of iron.

Peroxide of iron,	5 parts,
Hydrochloric acid,	19 parts.

Mix in a platina capsule, and boil for ten minutes to dissolve the oxide; concentrate the solution to 15 parts by a water bath, permit it to cool, and filter. This solution will be of a red brown colour; on the addition of water it becomes yellowish, if the hydrochlorate is neutral; and almost colourless, if it is acid. It is not decomposed by the air.

Crystallised perchloride of iron.

To obtain this product, pour a pound of liquid perchloride

of iron into a porcelain capsule, and eight ounces of liquid caustic potash into another; place these two capsules on a glass plate, and cover them with a bell glass. In 10 or 15 days, the chloride will be found crystallised in the form of granulated mammillary concretions; the fluid is to be poured off, and they are to be drained by turning the capsule over on the glass plate. This chloride is neutral, and very deliquescent. It should be kept in a glass stoppered bottle, with a wide mouth.

Acetate of the peroxide of iron.

Concentrated acetic acid,	16 parts,
Peroxide of iron, recently precipitated,	8 parts.

Heat the acid in a platina capsule, and saturate it with the oxide, adding it to excess. Withdraw it from the fire, permit it to cool, and filter through paper. This solution is of a vivid red, always acid, and unalterable in the air.

Nitrate of the peroxide of iron.

Crystallised citric acid,	4 parts,
Distilled water,	4 parts,
Peroxide of iron, recently precipitated,	8 parts.

Put the water and acid in a platina capsule and heat them; when the acid is dissolved, and the solution is at the boiling point, saturate it with peroxide, adding it to excess. Cool and filter. The quantity of liquid citrate obtained should be 16 parts. This solution is of a very deep red colour; it is always acid, but less so than the acetic solution.

Tartrate of potash and iron.

Bi-tartrate of potash in powder,	8 parts,
Distilled water,	24 parts,
Peroxide of iron, recently prepared,	q. s.

Mix the water and cremor tartar in a platina capsule, and boil; add as much moist peroxide of iron as is soluble in the fluid; saturate with a solution of caustic potash, filter and concentrate so as to obtain 20 parts of liquid. To obtain this salt

in a solid state, after having concentrated the liquid tartrate to a syrupy consistence, it is to be dried on the sides of the basin, by turning it, in all directions, over a moderate fire, till the salt is detached in scales. In this state, it is solid, transparent, of a deep colour, and very soluble in water. As it slightly attracts moisture, it should be kept in a well closed bottle.

Liquid acetate of ammonia and iron.

Liquid acetate of ammonia,	14 parts,
Liquid acetate of peroxide of iron,	2 parts.

Mix. This ferruginous spiritus mindereri is of a very deep red colour.

N.B. To prepare the above mentioned oxide of iron, termed peroxide of iron, recently precipitated; liquid perchloride of iron is to be mixed with a large quantity of water; the iron is to be precipitated with ammonia, washed several times, and subjected to pressure to get rid of the water. It will now form a pasty mass formed of oxide of iron and water.—*Journal de Pharmacie, October* 1831.

ARTICLE XII.—*On External Revulsive Applications. By I. Fauré, Sen.*

Many medicines, which were formerly employed by physicians, have been lost sight of, and which, nevertheless, in many cases, merit a preference over those which time and practice have consecrated.

I was reminded of this truth during the public monthly meeting, of the 7th of February last, of the Royal Society of Medicine at Bourdeaux, by the communication of a very im-

portant practical fact which would have required the use of a revulsant whose action was instantaneous.

I know that practitioners are acquainted with the means of producing immediate redness and irritation of the skin; but here, as in other cases, the difficulties in the employment or other indications render the choice of them difficult.

The revulsant most prompt in its effects, would doubtless be caloric, applied either directly or united to water in the state of vapour, or even frictions made with acetic acid concentrated to 10 degrees; but the inconveniences attendant on these processes, render the application of them rarely possible.

The want of a rubefacient which would act in two or three minutes, whose action could be circumscribed and regulated so as to stop it at will, or give it, if required, the energy of a blister, leaves an acknowledged hiatus in practice, and furnishes to pharmacy an opportunity of offering to it a new therapeutic resource.

I do not claim the discovery of a revulsant enjoying all these advantages; it was brought to light by those chemists who applied themselves to the analysis of black mustard seed (*Sinapis nigra*); and if the art of healing has not profited by it for some years past, it is, without doubt, because the attention of physicians has not been sufficiently drawn to its merits, and that no one has yet fixed upon a reasonable and correct formula, which would warrant the existence in pharmacy of a ready made preparation whose effect would be sure and constant.

This is the double end which I proposed to myself in writing this note.

The powder of black mustard seed furnishes, by distillation in water, an acrid and caustic volatile oil, to which it owes almost all its medicinal properties; its application to the skin produces great redness and even blisters. The water arising from this distillation has been proposed as a substitute for the ordinary sinapisms, from its having the advantage of producing a more prompt action; let us examine the use of these two products as applicable to the subject which occupies us.

Water distilled from powdered mustard, though holding in solution very little volatile oil, might, by reiterated applications, become, in certain circumstances, a substitute for sinapisms; but in violent cases, it would not be sufficiently active, and this water would be rarely identical in its effects.

By its energetical action, the volatile oil of mustard may become the basis of an excellent revulsant, and yet, although we are only considering an outward application, its direct use would require so much precaution, that we should be constantly afraid of serious accidents.

In order to determine a reasonable formula, it appeared to me less rational to try to increase the exciting force of distilled water of mustard, than to modify the acrid and caustic principle of the volatile oil. Among the mediums which I have submitted to different experiments, the spirituous ones, of a moderate density, have appeared to me most preferable.

Alcohol dissolves this volatile oil in large proportions, according to its density: highly rectified, it dries and crisps the skin, and assists the volatilization of the active principle before it can have acted sufficiently; if too weak, it dissolves but little volatile oil, and does not acquire the desirable efficacy.

After having thus recognised the necessity of fixing the strength of the alcohol so that, saturated with the volatile oil of mustard, it produces in a few minutes constant and invariable reddening effects; I have found out the proportions, the result of which, tried on a number of persons, and several times on myself, permits me to present with confidence the following formula;

Alcohol at 25 degrees of Baumé, 250 gram.
Volatile oil of mustard seed, 12 gram.

Mix and preserve it in a well stopped bottle.

This liquid produces a great irritation on the skin; it is sufficient to apply on the part a piece of fine flannel, or linen imbibed with the liquid, and to moisten it again in two or three minutes after, if it be necessary. The prickings produced by this application are the more sensibly felt from their

arising so quickly; redness of the skin is the consequence, and even pimples or blisters.

Before concluding, I will make an observation, which will not be without interest if not already known, that to suddenly quiet the pain occasioned by the effect of this revulsant, it is only necessary to pour two or three times over the irritated surface a few drops of sulphuric ether.—*Jour. de Pharm.*

Article XIII.—*New Experiments on Bitter Almonds and their Essential Oil. By MM. Robiquet and Boutron Charlard.*

[Translated from the French by T. H. Powers.]

The elements of organic products are in general so complicated, that it is only by repeatedly reverting to them, that we can demonstrate their true composition. And we see, that by attentively studying substances of this kind, we discover things unperceived by those who have before examined them. This truth is more clearly demonstrated to us every day; for we have seen bile, blood, urine, milk, opium, cinchona and many other substances, successively become the object of new investigations, and each time some more or less interesting results have attested the utility of such undertakings. We must not then become weary of studying substances of this kind; and although the credit we receive may not always be proportionate to the difficulties overcome, we should not the less seek to acquire clear ideas, on these interesting points of the science. From motives of this nature, we have undertaken to examine bitter almonds and their essential oil. This singular product, which has already been often examined, is still far from being well known; and we have no doubt but that a

careful study of it would have conducted us to some important results; but being obliged to interrupt our investigations, and not being able to foresee at what time we shall be permitted to finish them, we have concluded to publish what we have done, in order to furnish our successors with the means of penetrating further.

It has resulted from all the researches which have yet been made on the volatile oil of bitter almonds, that this remarkable product is particularly distinguished from the other volatile oils by the promptitude with which it absorbs oxygen; and, above all, by the singular property which it possesses, of suddenly changing by means of this oxygenation into colourless needle-shaped crystals, which are acid, and preserve their character of acidity, though they be submitted to a dry heat, which does not seem to cause any change, except that of subliming them into handsome white silky tufts; or treated by boiling water, which dissolves them completely, and again deposits them by cooling. We are aware that this volatile oil has not only the odour of hydrocyanic acid, but that it contains, when fresh, a considerable quantity; that very probably it is to the presence of this acid, that it owes its poisonous properties; and that, nevertheless, it may preserve the odour of hydrocyanic acid without retaining any sensible traces of it. In fine, we moreover know, that this volatile oil, suitably treated by the caustic alkalies, furnishes a peculiar crystalline substance, which is neither acid nor alkaline, is soluble in both alcohol and water, and more so in hot than in cold.

We imagined that one of the principal questions to be solved was in relation to the nature of the acid formed by the oxygenation of the oil. This acid had clearly been obtained, and its principal characters described by one of us; but it remained to name it; this was less inconvenient, it must be owned, than to have given it a name without having obtained it, as has been sometimes done.

We at first occupied ourselves with this point, but had scarcely recognised the identity of this acid with that obtained

from benzoin, when we learnt that this result had been already announced in the German journals. In fine, we were assured that M. Strange, pharmacien at Basle, had published in the Recueil de Pharmacie of Buchner for 1822, a memoir in which he established that the crystals which form spontaneously and by exposure to the air, in the essential oil of bitter almonds, are nothing more than those of benzoic acid.

This first point once established, it remained for us to examine whether acid existed already formed in the essential oil, or if it was not developed by the oxygenation of the principles which were united with it. But we have been diverted from this study by another not less interesting question, which seemed to demand precedence; namely, that relative to the existence of the essential oil itself in bitter almonds. It appeared much more important to occupy ourselves at first with this question, as it was presumed that its solution would throw some light on the nature of this supposed essence. Now, one of us had already observed that the volatile oil, which is drawn from bitter almonds by distillation, could not all exist formed in them, and gave in support of this opinion, the want of odour and taste in the simple expressed oil of the same seeds. Every thing led us to think that if these two products existed together, they would both be obtained by pressure, since once obtained separately, they easily combine with each other, and, besides, we are familiar with several similar examples; for instance, it is known, that the seeds of the umbelliferæ furnish, by simple pressure, a product which contains both the fixed and volatile oil. But it is entirely different with the bitter almonds, since when they are free from moisture, the fixed oil which is separated mechanically, is altogether as insipid and inodorous as that extracted from the sweet almonds. This fact has been fully proved by M. Planche, and is confirmed by the daily practice of the perfumers, who manufacture, at the same time, from the bitter almonds, the fixed oil, which they sell as oil of sweet almonds, because it possesses all the characters of it, and make their almond paste of the residue or cake.

It is, nevertheless, true that under some circumstances, the fixed oil partakes of the odour and taste of the bitter almonds. M. Planche attributed it principally to the action of the heat, for it is sufficient, according to this skilful chemist, to press the bitter almonds between warm plates, for it to acquire the odour of the essential oil. But MM. Henry and Guibourt have since shown that this change cannot take place, without the influence of moisture.

These were the acknowledged opinions, and have served us as a point to set out from. Our first care was to examine them minutely: and we have seen, in fact, that when the bitter almonds are a little old, and consequently quite dry, the fixed oil is inodorous; and that it is the same with the residue, whether we leave it in mass or reduce it to powder; that nothing will develope the odour in the fixed oil, while it is sufficient to moisten the residue, in order to disengage immediately a well pronounced odour of hydrocyanic acid. Thus, without doubt, the essential oil, or the elements of it, are contained in the almond cake, and do not run from it with the fixed oil, by expression.

Supposing, from the observations first made, that this supposed essential oil resulted from the combination of a particular principle with a certain proportion of water, we have tried several modes of extracting this principle, without the intervention of moisture, and we have successively employed very concentrated ether and alcohol.

Action of Ether on Almonds. These several treatments have conducted us to some results so curious, as to merit attention. The ether to which we had recourse in the first place, had no other effect than to withdraw the last portions of fixed oil which the pressure had not been sufficient to remove.*

* The apparatus which we used for this extraction answered, perfectly, the end we had designed. It was a vessel with a straight neck, containing about a pint, furnished with a cork stopper, into which was fixed perpendicularly the lengthened extremity of a glass adapter, and the adapter was, itself, furnished with a well adjusted stopper; a glass stopper was also

This treatment terminated, we dried the powder in the air, and evaporated the tincture in close vessels, with the heat of a water bath. These two products, that is, the powder washed by ether, and the oil obtained by the washing, were both quite inodorous, but the new residue washed with water developed as much odour as before. Thus far, there was nothing surprising; but what has surprised us, is, that if powdered almonds be washed with ether and dried, and then treated a second time by ether, this second washing furnishes by evaporation on a water bath a product which contains the essential oil of bitter almonds. Thus, without doubt, water is indispensable for the formation of this oil.

Action of Alcohol. If, instead of treating as we have indicated the first residue of the etherial washing, we submit it several times to the direct action of concentrated boiling alcohol, we obtain, after four successive decoctions, all that this vehicle will take up of the almonds. We remarked that the first tincture deposited some small tufts of opaque crystals by cooling, which consisted of very short needles disposed in concentric rays. These crystals, which are generally formed on the sides of the vessel, were detached, and united on a filter. On the other hand, we mixed the four alcoholic tinctures in a retort, and distilled them in order to preserve the alcohol.

let into the lower part of the adapter, and adjusted in such a manner as to present an obstacle, without completely opposing the running off of the liquids. The apparatus being thus fixed, we introduced into the adapter a sufficient quantity of almond kernels reduced to a fine powder to fill it about two-thirds full; we afterwards poured on enough ether to cover the powder about two fingers' breadth deep. The stopper of the adapter was then adjusted, and covered with several strips of pasted filtering paper, in order to prevent the evaporation of the ether, as much as possible. The ether gradually filtered through the powder, and flowed off layer by layer, and the oil was, if we may so say, driven to the inferior part of the tube, in such a manner that the first portions of liquid which ran into the vessel were pure fixed oil, easily known by its colour and consistence, while, towards the end, the ether descended quite as fluid and colourless as when we had employed it. We concluded that by this means the powdered almonds had been completely deprived of all the fixed oil which they retained.

This concentration was cautiously continued until the residue had acquired the consistence of a syrup; it was then allowed to cool, and afterwards poured into a long receiver made by closing one end of a large tube, five or six times its bulk of rectified ether poured upon it, the open end of the tube stopped with a cork, and the whole strongly agitated for some moments; we then placed the tube in a vertical position, and left it until the next day. By cooling, it formed itself into three very distinct parts; the first and most fluid was of a light yellow colour, that which succeeded it was of an opaque white and semi-solid, the third was amber coloured, transparent and of a viscous consistence. We readily separated the first and third parts by means of a syphon,* and the second being thick, was put to drain on a piece of fine linen. This mechanical separation performed, we occupied ourselves with purifying the different products. The first, which was little else than ether, was submitted to distillation in a water bath. The residue was a resinous yellow

* The syphon used was made out of a thin tube of small diameter, which we were able to bend in the flame of a candle. We adapted this syphon to a stopper of a proper size for the tube receiver; afterwards we adapted a very small tube bent at right angles to the same stopper, and disposed it in such a manner that we might blow into the receiver. This done, we proceeded as follows: we substituted this stopper in place of that in the tube, and sunk the small branch of the syphon nearly to the surface of the second or middle liquid; the other branch communicated with a bottle; we then blew through the small tube in order to make the liquid ascend through the syphon, and then decanted the first part. We then poured on a similar quantity of fresh ether, agitated again, and the next day drew off as before. When this was entirely withdrawn, and the syphon well drained, we stopped the long branch with the end of the finger, and pushed the other through the cork to the bottom of the receiver. It is as well then to blow slightly through the long branch in order to remove any particles of the second or middle substance that may collect in it, notwithstanding the precaution already taken. We then let the liquids rest, in order that they might rearrange themselves. When this had taken place we blew slightly through the small curved tube, and let the under liquid run off through the syphon as long as it continued to do so clear. When all the under part is drawn off, the syphon will generally stop of itself, as the intermediate substance, which is pasty, will cause an obstruction, but if this shows a disposition to rise, it will be easily prevented by drawing the breath through the small curved tube.

liquid, of an acrid taste, which brought to mind what is called the green resin of vegetables. The white chalky matter that formed the intermediate parts was dissolved in boiling alcohol. The filtered solution deposited on cooling a number of small, white, needle-shaped crystals, of the same nature as the tufts deposited by the first alcoholic tincture of powdered bitter almonds.

The viscous liquid that formed the third part, was deprived of the ether which it had retained, by a moderate heat, it became of the consistence of honey, preserved its transparency, and possessed a sweet taste, together with a slight bitterness; we have not been able to separate any other principle from it.

Thus the alcoholic treatment furnished three different and very distinct products, viz. a resinous matter; a peculiar crystalline substance; and lastly a kind of liquid sugar. But what is most remarkable, is, that no one of these three products had any odour of bitter almonds, and that, nevertheless, the powder which had been successively treated by ether and alcohol, or only by alcohol, did not develope any odour of prussic acid on the addition of water. We tried in vain all the means which appeared to us the most capable of developing this odour, whether on each of the products taken separately, by uniting them, or by adding them to the powdered almonds from which they had been extracted.

There is, without doubt, a very volatile principle which serves as a tie for the others, and which is destroyed by the alcoholic treatment; what would seem to prove it, is, as we have before said, that the presence of hydrocyanic acid is very evident in the products of the distillation of bitter almonds, while here nothing will detect its existence, not even the action of caustic alkalies, which manifested it so promptly in the essential oil. We must remark, nevertheless, that the white crystalline matter gave out a considerable quantity of ammonia, when treated by a solution of caustic potass with heat. Since this substance contains nitrogen, may it not become, by means of an alteration and combination which are unknown to us,

one of the elements of the essential oil? We should be the more disposed to think, that this same substance possessed, even in its most pure state, the taste of bitter almonds, and that sweet almonds do not furnish any analogous principle. These observations determined us on studying this remarkable product particularly; and we shall give the results of our experiments; but, before we occupy ourselves with this subject, we will finish that relating to the almonds themselves, and we shall commence by repeating that the portion of bitter almonds which have undergone the action of alcohol, does not furnish by distillation with water a particle of essential oil, and that not only the product we obtained did not manifest the least odour of bitter almonds, but that the reagents did not show the least trace of hydrocyanic or any other acid. It is therefore certain that alcohol takes up or destroys, either the whole or at least a part of the essential oil. To assure ourselves whether the alcoholic residue contained any principle that might contribute to the prompt formation of prussic acid, which, under ordinary circumstances, is formed as soon as we moisten the powder, we treated a portion of this residue with cold distilled water; after some hours maceration we obtained, by filtering, a yellowish limpid liquid, insipid to the taste, frothing much by agitation, and coagulating with heat. All these properties are found in the sweet almonds, and M. Boullay made them known a long time since in a memoir published in the seventh volume of the Journal de Pharmacie.

We shall only remark in passing, that this coagulation, which some have attributed to vegetable albumen, presents some characters, which might seem to be derived from another body; and this was particularly observable when we experimented on the powdered almonds entirely deprived of fixed oil by ether, and afterwards treated by alcohol. In this case, the watery washing submitted to the action of heat, thickened, became consistent, but did not coagulate even when kept in a state of continued ebullition. If permitted to cool, the con-

sistence is augmented and we obtain a mass as solid as starch, but which, by heating anew, becomes slightly liquid; afterwards reassuming the same consistence on cooling: and it is possible to reproduce the same phenomena several times by different temperatures.

We never have heard that ordinary albumen presented any thing similar. That we may not be diverted from our principal objects, we shall not push this subject any further, but return to the watery washings; we will mention, however, that when coagulation is not effected by means of heat, some hours of repose are sufficient to separate from it a quantity of liquid, which affords by evaporation only a species of common gum. Thus we have not found in the residue any thing meriting particular attention.

[To be continued.]

MINUTES OF THE COLLEGE.

December 27, 1831.—The Board of Trustees reported the election of Franklin R. Smith as a resident member.

The following gentlemen were duly elected honorary members: Professor Julius Ducatel, Baltimore; Dr Thomas I. Wray, Augusta; Dr Jacob Bigelow, Boston; and Michael F. Faraday, London, a foreign member.

A communication from Wm Hacquin was read, accompanied with specimens of Latin labels, printed on coloured paper, which were referred to a committee.

January 1, 1832.—The committee appointed to examine the labels submitted by Wm Hacquin for the approval of the College, reported and offered the following resolution, which was concurred in: "That the College cannot approve of the book of labels submitted to them, in as much, that they are not in conformity with the nomenclature adopted by the United States Pharmacopœia.

A committee was appointed to take into consideration the propriety of having a set of Latin labels printed by the College in conformity with the nomenclature adopted in the United States Pharmacopœia.

The subject of bringing into more general use the formulæ prescribed in the United States Pharmacopœia being under consideration, the following resolution was adopted: "That a committee be appointed to confer, with such committee as may be appointed by the College of Physicians, on the best means of introducing the Pharmacopœia of the United States for 1830 into general use as the standard of the shops, and the

Secretary was directed to communicate this resolution to the College of Physicians.

February 28, 1832.—The committee appointed to confer with such committee as might be appointed by the College of Physicians to consider the best means of procuring the general adoption of the Pharmacopœia of 1830, reported, that that body having appointed a committee of conference, the joint committees agreed to recommend to the respective Colleges the adoption of the following resolution, to be signed by the presidents and to be published in the different Medical and Pharmaceutical Journals: "Resolved, as the opinion of the Philadelphia College of Physicians and Philadelphia College of Pharmacy, that the United States Pharmacopœia of 1830, as revised by the National Medical Convention which met at Washington in January 1830, and published in Philadelphia, deserves the confidence of the medical and pharmaceutical professions; and for the purpose of promoting uniformity in pharmaceutical formulæ—the two Colléges do agree to adopt the said work as a standard of pharmacy, and recommend to their respective members to conform to its directions."

The following form of an agreement was also adopted, and a committee appointed to procure the signatures of the members of this College thereto.

"The undersigned, members of the Philadelphia College of Pharmacy, convinced of the importance of having an uniform standard for the preparation of medicines, and believing the Pharmacopœia prepared by the National Medical Convention of 1820, and revised by that which met at Washington in January 1830, to be the best adapted to meet this object, do hereby agree to adopt the formulæ of the same as the standard of their shops, and to comply with its regulations in compounding the prescriptions of physicians, unless otherwise directed."

The following is a copy of the agreement which has been submitted by the Philadelphia College of Physicians to its members.

"The undersigned, members of the Philadelphia College of Physicians, convinced of the importance of having an uniform

standard for the preparation of medicines, and believing the Pharmacopœia, prepared by the National Medical Convention of 1820, and revised by that which met at Washington in January 1830, to be the best adapted to meet this object, do hereby recognise the authority of the same, and agree to use their influence with the apothecaries to procure the adoption of the formulæ in their shops."

The following gentlemen were duly elected honorary members: Dr John Torrey of New York, and Thomas Nuttall of Boston.

March 27, 1832.—The committee appointed to obtain the signatures of the members of the College of Pharmacy to the agreement approved at the last meeting, made the following report.

To the President and Members of the Philadelphia College of Pharmacy.

The committee appointed to obtain the signatures of the members of the College to the agreement respecting the Pharmacopœia, respectfully report:—

That they have attended to the duty assigned them in part, having obtained the signatures of nearly all the members of the College. The completion of this task, from a variety of unavoidable circumstances, has not been practicable; it will however be attended to, with as little delay as possible.

Your committee may state, for the satisfaction of their fellow members, that they were much gratified to find so universal an approval of the objects of the agreement, among those who were solicited to sign it, and believe, if the individual attention of the members is kept alive to it, that in a short time this much desired uniformity in pharmaceutical preparations may be accomplished. It would be more than could be expected that individuals will literally adopt all the formulæ in a work of this kind, however desirous they might be to do so, except they are individually convinced that every one of the formulæ is either than better or as good as any other.

It will hence be necessary for the College, ere it can expect

a universal adoption of it, to take some trouble to prove that the formulæ in it are based upon correct principles, and that they are not only as good as, but preferable to any others. In order to accomplish this, they propose that the College appoint a committee who shall, between this and the meeting in September, personally wait upon every member of the College who shall sign the agreement. By that time, it is believed, nearly all of the formulæ will come under his immediate review. Your committee certainly believe that no member who has signed the agreement would fail to comply with its requisitions, except he had, at least in his own opinion, a good reason. If it should be ascertained that any have not complied, this committee shall respectfully request the reasons which induced it, and if they should prove to be any supposed imperfections in the formulæ, they shall carefully note them down, and report them to the chairman of the committee on the Pharmacopœia, who shall report them to the stated meeting in September.

The committee shall invite from all, free and unreserved strictures of any and every kind.

They also respectfully suggest, that the secretary of the College be directed to state, on the notices of the meeting in that month, that this report will be read, and urge the attendance of all the members at that meeting. At that meeting they would recommend, a free discussion be encouraged upon all of the formulæ objected to. And furthermore, that each formula, as shall be decided by the College as requiring alteration or amendment, shall be submitted to the College of Physicians, with the reasons for such alterations or amendments, requesting their concurrence therein, and should they approve thereof, these formulæ shall be considered the standard, as respects this city, in place of those which may be amended.

The Secretary shall require at least 100 copies of the amended formulæ to be printed, a copy of which shall be sent to each member of the College living in the city.

Your committee believe that except some such arrangement

as this is made, we shall fail in achieving the object which all acknowledge to be of such great magnitude. They also believe that the adoption of such measures as these, would have a tendency to unite the apothecaries of the city more firmly than they ever have been before, and moreover, to interest many who are now lukewarm in the laudable objects of our association.

J. SCATTERGOOD.

On behalf of the Committee.

Whereupon it was on motion resolved that the College approve of the suggestions of the committee, and the subject was referred back to them to carry into effect.

The Publication Committee made a report which was accepted.

J. Clemson, manufacturing chemist, now resident in Philadelphia, was elected an honorary member.

The following gentlemen were duly elected officers, trustees, &c. for the ensuing year.

President, Daniel B. Smith.

Vice Presidents, S. Jackson, M.D., Henry Troth.

Recording Secretary, Charles Ellis.

Corresponding Secretary, Elias Durand.

Treasurer, E. B. Garrigues.

Trustees, Edward Needles, Warden Morris, Charles Dingee, A. Fullerton, Jun., J. Reakirt, John Carter, S. C. Sheppard, John C. Allen.

Publishing Committee, D. B. Smith, G. B. Wood, M.D., R. E. Griffith, M.D., Charles Ellis, Jos. Scattergood.

MISCELLANY.

Oil of Ocymum basilicum, by M. Bonastre.—Great uncertainty exists, as to whether, under all circumstances, volatile oils, or at least the majority of volatile oils, contain within themselves, the crystalline matter which serves to distinguish many of them. It is indeed very remarkable that from plants which are identically the same, there may be obtained, by distillation, some volatile oils, which are susceptible of crystallization, and others which are not. I have endeavoured to discover the cause of this species of anomaly, but have never arrived at any satisfactory results.

Some years ago, M. Dublanc, Jun. presented to the society some volatile oil of peppermint, which, by a diminution of temperature to some degrees below zero, became almost entirely crystallized.

Since that time, and in consequence of the invasion of the cholera-morbus in Europe, medical science has endeavoured, by all possible means, to oppose the ravages of this fatal disease; and in some countries, particularly in the north of Europe, essence of peppermint has been extolled as a more or less advantageous remedy for cholera.

On account of this opinion, there has been a considerable demand in France, for the volatile oil of peppermint, and our country alone, not being able to afford a sufficient supply, we have been obliged to have recourse to foreign markets.

From the information which I have collected, and which has been very exact, I find that in the month of July last, 700 pounds of volatile oil of peppermint were exported from France to Germany. Of this enormous quantity, which must startle all physiological physicians, France only furnished 200 pounds; the other 500 came from abroad, especially from America.

An important observation, which I have been enabled to make, is that almost all the essence of peppermint from America, possesses the singular property of forming beautiful crystals, at some degrees below zero.

The essence of mint distilled in France, does not possess this remarkable property, at least under all circumstances, or in the same degree.

The essence of sweet basil which I have the honour of presenting to the society, also possesses the property of crystallization; unfortunately, I can give no certain account of the time required for this process; it is sufficient to state, that the crystals formed in the volatile oil in the midst of the fluid portion of the upper part of the phial. The concrete portion occupied the lower part.

The crystals of the essence of sweet basil are pyramids with four very narrow faces.

They are but slightly soluble in cold water, but considerably so in boiling water; it is sufficient to filter it warm, and let it remain undisturbed; in a few hours, the crystals deposit in the form of regular tetrahedrons, tolerably white, and perfectly transparent.

They are partly soluble in cold alcohol; this solution gives a red colour to litmus paper; boiling alcohol dissolves them completely; they crystallize perfectly by cooling, and in the same manner as those described above, viz. in pyramids with four faces.

Under these circumstances, the first crystals deposited from the alcoholic liquid occupy the circumference of the capsule; they form groups at certain distances, in fine radiating fasciculi, composed of an innumerable quantity of well defined needles.

The crystals progressively deposited, from the same solution, at the bottom of the capsule, are of a larger size than those on the circumference.

Crystals derived from the aqueous solution have scarcely any taste; those from the alcoholic, on the contrary, possess the smell and taste of the oil of sweet basil, though in a less degree.

One part of these crystals will not dissolve entirely in six parts of sulphuric ether. They are, however, very soluble in cold nitric acid, and do not cause any remarkable coloration. Acetic acid dissolves them readily, and on the evaporation of the acid, crystals are deposited in silky filaments. Sulphuric acid reddens them sensibly.

An excess of caustic ammonia dissolves them; if water be poured into the solution, the latter becomes turbid, but does not froth when shaken, as takes place on a combination of the essence of cloves with the same alkali. When placed on burning coals, they burn and diffuse much smoke, and some odour.

If I had possessed a greater quantity of crystals, I should have been able to make more variation in my experiments, principally with hot nitric acid, which, operating upon a considerable mass, might have afforded some new product.

This fact suggests the following observation, that the concrete and crystalline matter of the volatile oil of sweet basil, though derived from a plant of the family of the labiatæ, still differs in many respects from the stearopton of the oil of sage, described by M. E. Herberger, and resembles, perhaps, more that of peppermint.

Besides, two specimens of the crystalline matter of the volatile oil of sweet basil, which I have the honour of presenting to the society, (the first of which is the result of aqueous solutions, and the second of an alcoholic solution) allow any who have seen the crystalline matter of the volatile oil of peppermint, to judge what analogy there can be between the regular form of the two crystalline matters.

Oil of Roses.—Professor Gobel of Dorpat has analysed the true oil of roses. The specimen was nearly colourless, but so strong as to cause headach on inhalation; a single drop dissolved in alcohol, was sufficient to fill a room with an agreeable odour for several days. It congealed into a white, foliated, transparent mass when exposed to a temperature of 32° F., but became fluid again at 72°. Alcohol of 0.815, dissolved 1-180th part of it at 65° F. A drop required 8000 parts distilled water to perfectly dissolve it. It is composed of carbon 69.66, hydrogen 16.06, oxygen 14.29=100.—*Edin. New Philos. Journ. Oct.* 1831.

Crystallization of Perchloric Acid.—M. Serullas states that the perchloric acid may be always crystallised by pursuing the following plan. Sulphuric and perchloric acid are to be successively introduced into a small retort, through a long tube; the beak of the retort is to be inserted into a tube curved and drawn to a fine point at the other extremity. Heat is to be applied, and when the liquid boils, and is kept in this state for some time, over a small fire, it will be seen to pass over into the tube and solidify there; the tube is to be kept cool with water; thick white fumes escape at the small end of it. The operation must be stopped before the mixture is discoloured, and as soon as any liquid passes over, which does not congeal. The experiment should always be performed with small quantities of the perchloric acid, say 8 to 10 drachms. Liquid perchloric acid may be concentrated by evaporation in a capsule, or what is better, in a small retort. The first portions that pass over are to be thrown away, as they are only water. M. Serullas has obtained it of the density of 1.65.—*Journ. de Chim. Med. June* 1831.

Hydrocyanic Acid.—The following case, related by Dr Damison, shows the necessity of great caution with regard to this article. A druggist had some hydrocyanic acid in a ground stoppered vial; as it had been prepared almost three months, thinking it was decomposed, he opened the bottle and applied it to his nose, to ascertain if the acid retained any smell; he instantly fell and remained for half an hour without giving the least signs of life. He finally recovered, after an illness of several days.—*Ibid. July* 1831.

Analysis of the Wood and Bark of the Guaiacum officinale.—These have been examined by Mr Tromsdorff, with the following results.

	Bark.	*Wood.*
Peculiar resin, different from gum resin of guaiacum	23	10
Resin of guaiacum		260
Gum	8	
Peculiar extractive matter of a bitter, pungent taste	48	8
Yellowish brown colouring matter	41	
Mucous extractive matter, with sulphate of lime	120	28
Woody fibre	760—1000	694—1000.

Ibid.

Oiled Silk.—The smell of this article, which is so disagreeable to many persons, can be removed, says M. Chevallier, by submitting it in a closed vessel, to the fumes of chlorine for ten or twelve hours, and then exposing it for a short time to the air.—*Ibid.*

State of Mercury in Mercurial Ointment, by M. Mitscherlich.—The mercurial ointment employed occupied four weeks in preparing; part of it was set to dissolve at a moderate temperature in alcohol, containing caustic potash in solution. The mercury was separated in the metallic state, and formed one globule at the bottom of the vessel; the solution was filtered, and the metal was carefully removed from beneath the filter; a white matter remained, which was not removed by washing, and which, heated in a tube, gave no metallic mercury, nor did it sublime. From this

experiment it appears that the ointment does not contain oxide, but metallic mercury. To be certain whether, by the reaction of the alcohol and potash, the oxide had not been reduced, the following experiment was made: 1.101 gramme of protoxide of mercury was triturated for a long time with lard. The ointment thus prepared was subjected to alcohol mixed with potash, as in the preceding experiment. The portion remaining undissolved had not the least appearance of metallic mercury; it weighed 1.196; submitted to distillation with muriatic acid, no metallic mercury appeared, but 1.29 gramme of proto-chloride of mercury, equivalent to 1.019 of protoxide of mercury. A small portion of the sediment, when heated, did not sublime.—*Philos. Mag. from Hensman's Repertoire.*

Chromium.—The usual process for obtaining this metal, by employing the oxide and charcoal, never succeeding well, M. Vauquelin has proposed the following mode of reducing it from chromic acid, 72 parts of which will yield 24 of metallic chromium. Treat chromate of lead in fine powder, with four or five times its weight of muriatic acid, until it is perfectly dissolved; then evaporate to dryness, and dissolve the muriate of chrome by alcohol, that there may be no chloride of lead. Evaporate again at a moderate temperature, to the consistence of a syrup, and make it into a mass with a sufficient quantity of oil and a little charcoal, so as to form a paste; put it in a small crucible, inclosed in another crucible filled with charcoal powder, and heat in a bright forge fire for about an hour.—*Annal. de Chim.*

Crystallization of Bismuth.—The following process is given by M. Quesneville, Jun. to obtain beautiful crystals of bismuth. The metal is to be melted in a crucible, and small quantities of nitre occasionally added, the heat being raised so as to decompose the nitre, and the whole well stirred; after continuing the operation for some hours, the metal assumes green and yellow colours which remain even after it has cooled; if it presents only rose, violet, or indigo tints, and becomes colourless when cold, the crystals will not be fine. When it has acquired the proper hue, it is to be poured into a hot ladle, and the surface prevented from cooling more rapidly than the bottom, by being covered with a hot iron. The cooling should be rather sudden; or otherwise the metal crystallises in layers; when a crust has formed at the surface, a hole should be made through by means of a hot coal, and the fluid portion poured out; after the remainder has become cool it may be broken and the crystals will be found very perfect.—*Journ. de Pharmacie.*

A new Gum Elemi from Bengal.—M. Guibourt describes this resin as soft, having a strong smell which becomes pleasant on admixture with the air. It is contained in joints of bamboo, about twelve inches long by two in diameter; in this state it has recently been imported into France from Calcutta. M. Guibourt having sent some of it to Mr Pereira, Professor of Pharmacy and Materia Medica to the General Dispensary in London, requesting information respecting it, received the following account of it from him. That it was known in London, but had not been applied to any use; that Dr Wallich stated that it was known in Bengal by the name of *Guggul*, and is very similar to elemi, being, in all probability, produced by the *Amyris agallocha*, a tree found in the mountainous countries bordering on the districts

of Chittagong and Sillet, towards the north-east frontiers of Bengal.—*Journ. de Chim. Med.*

Hydrocyanic Acid.—M. Tilloy states that he has succeeded in preparing a medicinal hydrocyanic acid, the effects of which do not vary, and which can be preserved for several years, without any sensible alteration; this is

Cyanide of mercury	1 part,
Distilled water	4 parts,
Alcohol at 36° Baume	4 parts.

Dissolve the cyanide of mercury in the water, by aid of heat, and then mix it with the alcohol; add a very slight excess of hydro-sulphuric acid; throw in subcarbonate of lead; agitate several times, and distil in a water bath, so as to obtain all the alcohol saturated with the hydrocyanic acid.—*Journ. de Chim. Med.*

Cyanide of Potassium.—M. Chevallier observes that no work hitherto published contains an exact process for obtaining the cyanide of potash in a pure state. The usual plan is to calcine the ferro-hydrocyanate of potassa, then to dissolve it in distilled water, filter and evaporate to dryness. The procedure is impracticable, for the cyanide of potassa decomposes water on coming in contact with it. The result, therefore, would be hydrocyanate of potassa, and in heating this all the hydrocyanic acid escapes, and the residue will be merely potassa.

I have prepared this salt by calcining the ferro-hydrocyanate of potasha, then separating the cyanide of potassa from the quadricarburet of iron by pure alcohol, on distilling which, cyanide of potassa is obtained very pure and white.—*Ibid.*

Oil of Bitter Almonds.—From a memoir by MM. Robiquet and Boutron-Charland, in the *Annales de Chimie*, it appears that the volatile oil of bitter almonds does not pre-exist in the fruit, and that water is essential to its formation; 2d, that this oil becomes acid on exposure to the air, and furnishes benzoic acid, which, like the oil, did not pre-exist in the almonds; 3d, that they contain a peculiar principle, to which their bitterness appears to be entirely owing. This principle they have named *Amygdaline*; it exists combined with a saccharine matter, gum, a resinous matter, and an animal matter, which was regarded as vegetable albumine, but differs from this latter in several important particulars. After having treated this residue with the sulphuric ether, to get rid of these remaining portions of fixed oil, it is to be boiled with concentrated alcohol, which will dissolve the resinous matter the sugar and the amygdaline. In evaporating this solution to a syrup like consistence, and adding to it five or six times its volume of sulphuric ether, it separates, after having been shaken and then permitted to remain undisturbed, into three distinct layers, the upper consisting of ether holding the resinous matter in solution, the lower, which is viscous, of an amber colour, is the saccharine matter, whilst the intermediate is of a semi-solid consistence, of a white colour, and is amygdaline. This is to be purified by dissolving it in hot alcohol; on filtering it deposits as it cools a multitude of minute white needle like crystals.

Amygdaline has no action on test papers; it is inodorous, of a saccharine taste, mixed with a subsequent flavour of bitter almonds. It is not volatile; when heated it swells, giving out a smell like burnt sugar, which is succeeded by one like the hawthorn; when treated with a solution of caustic potash, it is decomposed, emitting a smell of volatile alkali. Warm nitric acid transforms it into benzoic acid.

From an analysis of it by MM. Henry, Jun. and Plisson, it appears to be composed of

Carbon	58,56
Hydrogen	7,08
Nitrogen	3,62
Oxygen	30,72.—99.98

Ibid.

Sulphuret of Carbon.—This article, discovered in 1796, has not as yet been admitted into the Pharmacopœias. From some experiments of MM. Wertzer and Pellengam, it appears: 1. That the sulphuret of carbon is one of the most energetic of the diffusible stimuli. 2. That it forcibly excites the action of the heart and arteries. 3. Its internal use soon occasions an acceleration of the pulse, an augmentation of the temperature, and an afflux of blood previously excited, especially towards the cutaneous and genito-urinary apparatuses. 4. The most prominent secondary symptoms it produces, are abundant sweats, an augmentation of the urinary secretion, and menstruation in females. 5. It has proved useful in chronic rheumatisms, without fever, in gout, &c. 6. On account of its great stimulating action on the arterial system its internal use is contraindicated in congestions of blood towards the internal organs, as in acute fevers.

The dose is from three to eight drops in barley or rice water, or in mucilage or syrup. The following tincture may be given in doses of from five to ten drops.

R.—Sulphuret of carbon	dr. ij
Pure alcohol	oz. iv.

Dr Wertzer also employs the following liniment over the affected part.

R.—Sulphuret of carbon	dr. ij
Camphorated spirits	dr. iv.

Sometimes instead of the latter ingredient he uses two ounces of olive oil.—*Jour. de Chim. Med.*

Oxalic Acid.—M. Gay Lussac states that when this acid is heated in a retort, a large quantity of a very inflammable gas is produced, which is composed of six parts of carbonic acid and five of oxide of carbon. From this he was led to believe that oxalic acid might be regarded as a hypo-carbonic acid.—*Ibid.*

Perchloric Acid as a test for the Mineral Alkalies.—From a paper on this subject by M. Serullas, it appears, that if a few drops of perchloric acid be added to a solution of potash and soda, a precipitate of perchlorate of potash is instantly formed, the perchlorate of soda, or the soda, if there be not an excess of acid used, remains in solution, whence they can be separated by concentrated alcohol, which, at the same time precipitates the small quantity of perchlorate of potash held in solution. A solution of perchlorate of soda, on the addition of potash, lets fall a precipitate of perchlorate of potash. When perchloric acid is added to solutions of the sulphate, nitrate, hydrochlorate, bromate, hydrobromate or hydriodate of potash, it forms a precipitate and the acids become free, and may be separated by means of concentrated alcohol. From these experiments it appears, that the perchloric acid forms an almost insoluble salt with potash, requiring to dissolve it more than 60 times

its weight of water at 15+0. 2. That soda forms a very deliquescent salt, exceedingly soluble in water and concentrated alcohol. 3. That the perchlorate of potash, on the contrary, is insoluble in alcohol. Finally, that by means of perchloric acid, the salts of potash may be decomposed, and the acid separated.—*Ibid.*

On Populine, extracted from a memoir by M. Braconnet.—This chemist has given the name of *Populine*, to an immediate principle, which appears to exist in the bark of different species of poplars, in that of the aspen, but which is found in the greatest quantity, in the leaves of the latter.

It may be obtained as follows:—A decoction of these leaves is to be made, and filtered whilst warm; sub-acetate of lead is now to be added, which causes a yellow precipitate; the liquid is then to be evaporated to the consistence of a clear syrup; and on cooling, the populine is precipitated in a crystalline form. This precipitate is to be forcibly pressed in a linen cloth, and about one hundred and sixty times its weight of water, and a little animal charcoal added to it; then the whole boiled and filtered; on cooling the populine separates in soft mass, composed of exceedingly fine silky needles. These crystals are to be drained and dried on blotting paper, and will then present the appearance of a very light mass, of a brilliant snow white colour.

The populine thus obtained has a saccharine taste, not unlike that of liquorice. It is soluble in two thousand parts of cold water, and one hundred and sixty times its weight of boiling water; and is still more soluble in boiling alcohol. It readily dissolves in cold concentrated acetic acid, as well as in nitric; it may be almost wholly precipitated from these solutions by the addition of water and the alkalies.

The same result takes place with phosphoric acid; but when this acid is very concentrated, it rapidly converts it, even when cold, into a resin. To be brief, the author has found that the mineral acids give rise to analogous phenomena, with both salicine and populine. The latter, treated with nitric acid, furnishes much carbazotic acid, without any trace of oxalic acid. Treated with potash, using proper precautions, it is transformed into oxalic acid.

Subjected to the action of fire, populine is changed into a transparent, colourless fluid: it takes fire and burns, giving out a peculiar aromatic odour, an odour having an analogy developed during the combustion of resinous matters. When distilled, populine swells up, and gives rise to a product, having an oleaginous appearance, which concretes and crystallises on cooling. If these crystals be pressed between blotting paper, they are deprived of a pyroxygenated oil, which is very acrid and having the smell of hawthorn, though much more powerful; there is also obtained a substance crystallised in micaceous, silvery scales, having all the properties of benzoic acid. It therefore appears that populine gives the same results on distillation, as the amygdaline of MM. Robiquet and Boutron Charlard.

Populine does not appear susceptible of forming a union with protoxide of lead; if it is boiled with phosphorus and water, it undergoes no alteration. Chlorine and iodine have no action on it.—*Journ. de Chim. Med.*

Vulpuline.—M. Bebert of Chamberry has discovered a new substance, to which he gives the name of vulpuline, in the *Lichen vulpinus, L.* The plant is of a deep yellow colour, which colour is wholly resident in its external membrane. When

heated with alcohol, the solution deposits, on cooling, a yellow matter which is soluble in ether and alcohol, and by spontaneous evaporation affords beautiful yellow crystals, which are pure vulpuline. This substance is crystalline, transparent, of a rich lemon colour, unalterable in the air, fusible by heat, and recrystallisable on cooling, volatilisable without alteration, rendered turbid by chlorine, not decomposed by the concentrated mineral acids, slightly soluble in cold water though giving it a decided yellow colour, very soluble in boiling water, decomposed by acetate of lead, hydrochlorate of tin, and the two nitrates of mercury. Vulpuline may be considered a new vegetable acid, as its solution reddens test papers, and its ammonical solution, evaporated to dryness, leaves a residue, from which ammonia can be disengaged by potash. The lichen itself appears to contain vulpuline in a free state, as its crystals are very perceptible. M. Bebert is of opinion that this substance will prove valuable as a yellow dye.—*Journ. de Pharm. December* 1831.

Burnt Sponge.—From an interesting paper on sponge and its products by M. Guibourt, we extract the following results. To obtain a burnt sponge rich in iodine, and efficacious against goitre, the following precautions must be observed. The sponge to be selected should be unwashed, having a strong odour, firm and compact. It is to be then put into a roaster similar to that used for coffee, and heated over a moderate fire, till it becomes of a blackish brown colour, when it is to be taken out, pulverised and enclosed in a well stopped glass bottle. It is always better when recently prepared, for even those sponges containing most iodine when first burnt, retain a very small portion of this product at the end of a year.—*Journ. de Chim. Med. December* 1831.

Protoxide of Copper.—The most simple and easy mode of obtaining the protoxide of copper in a pure state, is the following. The copper is to be dissolved in hydrochloric acid, to which are to be gradually added small portions of nitric acid; the solution is then to be evaporated to dryness, and the residuum heated to fusion; it is thus transformed into a brown crystalline chloride. It is now to be melted with anhydrous carbonate of soda, in the proportion of ten parts of the former to six of the latter, in a covered crucible and at a low red heat. The mass is to be treated with water to dissolve the chloride of iodium that has formed; the protoxide of copper separates in the form of a beautiful red powder, which is to be washed and dried. If sal ammoniac be added to the above mentioned mixture, the whole chloride is reduced, as may readily be supposed, and separates in a spongy form, when the mass is mingled with water.—*Annales de Chim. July* 1831.

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Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.

Drawn from Nature by W.P.C. Barton.

Tanner, Vallance, Kearny & Co. sc.

GERANIUM MACULATUM.

(Spotted Crane's-bill.)